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ARCHITECTURAL PERSPECTIVE . . .

THE WHOLE COURSE AND OPERATIONS
OF THE
DRAUGHTSMAN
IN DRAWING A LARGE HOUSE IN LINEAR PERSPECTIVE

10303

ILLUSTRATED BY NUMEROUS PROGRESSIVE DIAGRAMS,
BIRD'S-EYE AND OTHER VIEWS OF A HOUSE,
VIEWS OF INTERIORS, ETC.

With Hints on Pen-and-Ink Drawing

BY

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ARCHITECT AND SURVEYOR

THIRD EDITION

Capio Lumen

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PREFACE.

THE Author, in preparing the diagrams which will be found in this volume, has considered only the practical side of the subject, and he would recommend those who desire to acquire a theoretical knowledge of perspective to study some of the many existing works treating thereupon. He found the *theory* difficult to understand, and never truly followed in practice. Its attainment, however, is an ornamental if not useful accomplishment, while the value of a thorough *practical* knowledge of architectural perspective cannot be overestimated by the draughtsman. To design well without it is hardly possible.

The following work is divided into three parts. The First Part, dealing with elementary rules and instructions, is amply illustrated, to prepare and lead on the student to the Second Part, in which is given the whole course of drawing a large house in perspective. The Third Part deals exclusively with parallel perspective, which is generally employed to illustrate interiors.

At the end will be found a large plate of the house illustrated, *in outline only*, which will convey a correct impression of what the true perspective will be (Plate 1).

A correct plan of the house follows (Plate 2), to obtain the above outline; but to make a complete true perspective, all the detail should be shown and projected as hereafter described.

A complete sketch of the house in pen-and-ink is also given (Plate 3). It was not planned and projected, but simply designed and drawn by hand by the Author previously to the preparation of these diagrams, and may be taken as a rough sketch *only*.

All the following diagrams of the house are drawn to the same scale as the general plan and outline of house, and may be traced and fitted over it to obtain a clearer knowledge of the mode of working and projecting them.

Diagrams for obtaining bird's-eye and other views, including an interior by linear perspective, will also be found in the work (see Plate 4,* &c.).

A practical and simple way of making a temporary centrolinead for any perspective, at the cost of a few pence, is illustrated at the end of Part II.

The diagrams are arranged progressively, and in a form easy to be understood by the novice, for whose information they have been prepared.

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* Now Plate 6.

NOTE TO THE SECOND EDITION.

The present edition of this work will be found materially improved by the addition of three new Plates, numbered 4, 5, and 7 (Plate 4 of the First Edition being now Plate 6), and of a new Fig. (25) in Part I. A few corrections have also been made.

The Author may add that he is aware that the subject might have been treated much more fully than in the present volume; but his experience is that in works of the kind too much is often said or attempted, and sometimes only with the result of disgusting the student with the whole subject.

The attention of the reader may be invited to the fact that the headings in the text—Figs. I., II., III., etc. (in Roman numerals), correspond to Figs. 1, 2, 3, etc., in the diagrams.

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ARCHITECTURAL PERSPECTIVE.

ON DRAWING PERSPECTIVE.

The writer offers the following hints as his individual view of drawing, &c. These hints he generally endeavours to follow in practice, but the student can use his own discretion as to how far he will follow them. On perusing them he will probably think it "all very well," and quite an easy matter, to criticise (other people's work especially). The writer feels this is true, but it is done with the intention only of so directing the student that he may judge for himself the merits of one style with another.

In pen-and-ink drawing, more particularly perhaps than in coloured drawings, the arrangement of light and shade should be carefully studied. It no doubt requires considerable experience and practice to feel quite confident that the effect one proposes to give the picture will turn out a success, the whole thing depending, after it is drawn in completely, on the arrangement of light and shade, the amount of darks required and where to place them. The amount of light or white paper, and the running of one into the other, or placing them together for greater contrast, all require some consideration before commencing the inking-in. The drawing should not be done without some purpose in view, nor done at random, trusting to Dame Fortune for the result produced. Take a good look at the drawing, and having arrived at some definite arrangement endeavour to carry it into effect. The novice should be very wary of overdoing the drawing; but after some practice he may lay on the ink as black as he can make it, where it occurs, such as the vacant spaces of open windows, but few of these should appear in a drawing, otherwise a very spotty effect will be produced. The paper being white, representing sunlight, the student will not be required to make it, and it can only be his fault if he takes it away by covering the paper with ink. Unfortunately it is very difficult in some cases to draw a distinction—in trees, for instance, where it is intended to show a flood of light on a mass of foliage, and at the same time to make it quite apparent that it is not an air space seen through the tree. However, they say practice makes perfect. Of course this difficulty does not occur when colour is employed, but only with ink or mono-chrome.

The arrangement of light and shade may vary according to the taste of the draughtsman, who has every opportunity, especially in street architecture, of employing cast shadows from surrounding objects, and in the case of an isolated building a passing cloud will answer the purpose, care being taken to follow the contour of the site or ground and the various projections of the architecture.

If the novice should enquire how he can best produce a dark colour, or represent the colour of material, in *ink lines*, the writer can only recommend him to study the drawings of standard draughtsmen, and note how they dispose their ink lines and the direction these take, the various thicknesses and distances of the lines from each other, and the object they fulfil: the various styles to be compared with a view to considering if the excessive labour apparent in one gives the drawing a greater value than another, with as good an effect or result, and with evidently little labour or time spent on it. Some draughtsmen, apparently, trouble themselves very little how they make a dark shade; others again exercise labour painful to see. A certain amount of labour is necessary, and darks should be carefully done, but avoid the cast-iron effect of the very careful and over-precise draughtsman.

Apart from light and shade, artists duly consider the local colour of materials, and in all good work it can be easily traced. By *local colour* is meant, referring to a house, that usually the slates are darker than, say, a plaster wall. The draughtsman should endeavour to give the slates their dark appearance, and the same remark applies to all materials, &c., throughout the drawing.

Some of the best architectural draughtsmen affect a certain style, which totally ignores such small matters as local colour. It appears sufficient for them to leave the slates—and in fact, nearly all the roofing—staring white, with perhaps a dozen or so tiles patched up in the gable in full detail, with the additional attraction of some two dozen bricks or stones on the nearest quoin, or elsewhere; bushes to follow suit, so many leaves and no more. Their fanciful style is very pretty, but the spectator might naturally enough remark that he never saw a building under such an effect of light.

The writer recommends the experiment of standing before a building, and while looking at it *generally*, to count a few bricks here, a like number of slates, and so on.

The style referred to is not by any means easy to copy, and no doubt requires judgment and skill. It should not, however, be followed in any attempt at a finished drawing, for although sketchy and pretty, it is not altogether correct.

On the other hand, some draughtsmen show an enormous amount of detail, and if time is an object, cover up a large part of the building with an architectural tree, made up with scratches and unmeaning touches galore.

Such trees, if any must be introduced into the drawing, had better take a less prominent position and retire to the side, or perhaps to the back of the buildings. Rather have the shrub with its half-dozen leaves and a few twigs.

The most difficult perspective to draw happily is that covered all over with detail. A spectator looking at the Houses of Parliament would find it impossible to see the full detail of the Clock Tower and of the Victoria Tower also, but many draughtsmen would endeavour to show both on a drawing.

There is also the mechanical style, aspiring to artistic effect, but seldom getting beyond the stiff, straight, cast-iron drawing. Everything may be correctly drawn, light and shade perfect, but none the less the cast-iron effect remains rather than that of an artistic drawing.

Many consider it best to draw the perspective very truly in outline, with a large amount of detail and but little working up; a few touches and darks placed where likely to tell most, and the drawing is done. It may be the correct method in a strictly architectural sense, but the effect appears to most people rather *shadowy and "liney"* if not done by a skilful man; a drawing should appear as if firmly seated on the ground, and not supported on air.

The writer would recommend a modification of the styles indicated: a fair amount of light and shade to be considered necessary; local colour at least suggested; a free style merging somewhat into apparently careless drawing rather than mechanical; and a total absence of mannerism.

It is usual to make the drawing about the same proportions in length and breadth as an Imperial sheet of drawing paper, larger or smaller, but never in a square, which has a very ugly effect.

PERSPECTIVE EMBELLISHMENT.

It is usual to introduce foliage of some kind into a drawing, but unless the architectural draughtsman can draw a tree, it would be better (if he *will* have it) to form a background, but certainly it should not be given a prominent place in the drawing. Meanwhile the student might practise drawing a tree till it becomes familiar to him.

Perhaps the same remark will apply to figures, though many can draw them very well, but will fail in drawing a tree, and *vice versâ.* Some, no doubt, can draw both ; anyhow, a drawing can be made very well without either.

If figures are introduced, they should be drawn well in the perspective, and never at the sides or corners, and the background for them should be an uninteresting part of the building.

To follow these hints would possibly be a great hardship to many. They can draw a figure in full detail—perhaps a policeman, for instance—and take every opportunity of putting him exactly where he is *not wanted.*

The architectural draughtsman, as a rule, should devote his whole attention to the building ; trees and figures may then be added, but only so far as to help the building, which it is the *first object* to draw.

There are few who can draw a sky in pen and ink; to do so fairly well requires the greatest skill. The writer for his part never attempts it, but leaves the white paper almost untouched. The novice, anyhow, should do likewise; and the same recommendation applies to foregrounds. To draw an artistic foreground is often beyond the skill of the architectural draughtsman, and if it be badly done, and space be covered with ink without purpose, the whole drawing is spoiled.

Some architectural skies and foregrounds are positively dazzling, and hardly repay the time spent on drawing them. They go far to spoil the effect of daylight, which may easily be lost by too many lines and scratches all over the drawing.

It is well to have a thorough knowledge of shadows and how to project them properly, even if not always strictly followed, which appears to be more often the case than not, especially by the "artistic" draughtsman, who ties himself to no law in drawing, and makes just so much use of shadows or anything else as will serve his purpose.

The novice will probably do the same later on, but meanwhile he had better make full preliminary studies or he will never become an artistic draughtsman.

Where arches and curves occur in the perspective, it is best to obtain some of the leading points truly projected from the plan, and then to draw through them in pencil by hand, and afterwards to go over and cover the pencil curves in ink with compasses neatly. In large perspectives, as in the arches of a church, this is absolutely necessary.

Never draw anything grotesque or too exaggerated in architectural perspectives, unless it is intended especially to be so, as in the case of gargoyles, statuary, &c.

In *parallel perspective*, as applied to drawing interiors, do not let the end of the room come to nearly a point, as in Fig. 1. It will be found that the distance of the spectator from the ground line will regulate this effect. See Figs. 2 and 3. It is always best to place the spectator to view more of one side of the interior than the other side (see Fig. 3), and not on a line forming a centre line through the plan, as in Fig. 7.

It is natural to see more of the ceiling than the floor; but at times more floor than ceiling is required; if so, keep up the horizontal line to any reasonable height.

It is always better to make a large plan for a perspective than to make a drawing from a small plan, as shown in Fig. 7.

When the rules of perspective have been mastered by the artist, he seldom allows himself to be tied by them hand and foot. Some licence is allowed, if not too exaggerated, in drawing an artistic perspective.

The novice is advised to reverse all the following diagrams, by placing the point of sight on his *left-hand* side, which will give a different view of the building, and be found excellent practice.

The young draughtsman will also bear in mind that, in securing a good result, much depends on the composition or arrangement of the drawing.

By the *composition* of a drawing is meant the way it is put together or *grouped on the paper*—not the design of the buildings—so as to give the most pleasing effect to the spectator, for instance. In a building having a large and lofty tower, it would not please the eye to see the tower placed exactly in the centre of the paper, nor yet too near one of the sides of the paper; a little from the centre one way or the other is best.

The drawing should be fairly balanced. This does not mean the *design* of the buildings—which may be irregular, and grouped according to taste and the skill of the designer, or as symmetrical as a Grecian temple, although it is more difficult to balance an irregular design. However, with the aid of the surrounding buildings, trees, and figures, and with proper proportions of light and shade, there should be no difficulty if placed on the drawing *where wanted.*

As regards the introduction of statues on buildings, and the effect they produce on the design or drawing, the writer would only remark that in architecture statues may *ornament* a building or drawing, but should not appear grotesque (with the exceptions before referred to), nor be introduced to the detriment of the architectural design; nor should anything in the buildings be *sacrificed* for them.

HINTS ON THE DRAWING AND COLOURING OF PLANS AND ELEVATIONS.

A FEW remarks in connection with the ordinary preparation of architectural plans and elevations as followed by the writer may have some interest for novices, many of whom (he has found) require information on the most elementary matters, which one would think they should have learnt during their pupilage. Owing, probably, to their own want of interest in their work, they neglected to take advantage of what they might have learnt from their surroundings when pupils, much to their disappointment later on. Their neglect, however, only affects them, and not the gentleman who has pocketed as large a premium as he could get; it being generally understood that the premium is accepted as an entrance fee to the office, and not for personal tuition, which as a matter of fact is too frequently lacking.

The novice may be surprised to learn that anything can be said as regards an ordinary lead pencil and how to use it. Possibly so, but the writer has known an architect who insisted there was only one proper way of cutting a pencil—and that was, with a chisel end. But even if time in cutting the pencil were no object, the writer cannot recommend it, for this reason—that in drawing a line the full length of the ⊢ the pencil is apt to turn in the hand, with the result that one end of the line will be much thicker than the other, unless extreme care be taken, and at a great loss of time. Cut the pencil, therefore, long and sharp with a conical end, and keep it so, at all stages of the drawing.

It is very much easier to draw with a soft pencil than a hard one, and if a good point is kept the drawing should come out clear and effective. It will be necessary to rub the **T** square, set squares, scales, &c., frequently with a clean piece of rough drawing-paper to keep them clean, and to save soiling the drawing. If the drawing is to be finished in pencil, then the sharper the lines appear the better. It is not difficult to give the pencil a half turn or twist between the thumb and forefinger immediately the line is being drawn, which will go far to give the effect required.

To set the pencilled drawing on the paper when finished, some go over it softly with a large brush and milk, others in the same manner use clean soft water with a very little gum mixed in it. It is better not to follow either plan, but if the drawing is worth it, to give it a frame and glass. Always use a good pencil and good indiarubber, especially if the drawing is to be coloured, in which case do as little rubbing out as possible.

It will be well to have two or three drawing-pens of different sizes and of good quality. Before using one, test if properly set. This is best done by ascertaining if it will make a good firm line, holding it with the thick nib next to the **T** square, and then with the thin nib; that is to say, it should make equally as good a line either way, if properly set. When using it, take a firm hold with the fingers—as near as possible to the ink without soiling them—and keep it at all times nearly perpendicular to the paper, not slanting, and shove it away from you rather than pull it towards you. The same remark applies when using the set-square. Never let the ink run too low in the nib, or a broken line will probably be the result. The ink should not be too black in inking-in plans, elevations, &c., which are to be coloured, but should be as black as it can be made for ink drawings. When the work has to be quickly done, Wolff's liquid ink in bottles may be used, but the stick is best. Ink-in with a good firm line, not too thin.

The writer cannot recommend the use of different shades of ink on a drawing. If it is required to give the effect of distance, a *thin* line of black ink answers the purpose better than a thick faint line of diluted ink.

The writer prefers open set-squares to vulcanite, especially for pencil drawings, as the vulcanite will take up the pencil dust more and soil the drawing sooner. They should be tested, to find if they are true, in this way. Draw a line carefully up the paper from you, then reverse the set-square and draw a line towards you: these lines should both be exactly at right angles with the T square, and should cover each other; if not, the set-square is incorrect, and should not be used. This often occurs with vulcanite, which expands greatly in hot weather.

Now as regards colouring plans and elevations. Many and various are the styles: some look well, and some do not. Some people fancy bright colours; others neutral; and many any colours that come first to hand. Some insist on certain colours being used each for a certain purpose and material, particulars of which are given on a list for the information of those who will follow them. Compound tints are disallowed, for they are difficult to match correctly when required. As a general practice the drawing is first well damped with water previous to any colour being put on, and when nearly dry a thin wash of some yellow tint is put over the whole of it, or nearly, except the sky. Yellow ochre and a touch of lake mixed, Indian yellow or raw umber, will do, according to the tone aimed at. Then the colour for the tiled roof, bright or dull, or it may be purple or green slates. Tint of cobalt for sky (if any). If the paper gets too dry another wash of water. Then for brickwork in elevation, scarlet lake toned a little and laid on flat and evenly, carefully leaving all stonework yellow as first put on, or yellows and greys if stonework only. Strong Indian ink wash on the windows, or may be a green tint or charcoal grey. Purples and greys for shadows, laid on strong and carefully, and a general touching up, complete one way of finishing an elevation.

The plans and sections may be treated in a somewhat similar way. A first wash of yellow, grey, or any suitable colour to go all over them; strong scarlet lake or carmine for walls (some prefer India red—a dull colour at any time, and more so later on); stonework in section, or plans and sections, blue. The various other tints for fittings, &c., kept bright with plenty of yellow in them, should produce very presentable drawings.

Printing and lettering of plans comes last. The novice has a wonderful variety of styles to choose from if he will refer to any volume of the professional weekly papers—some plain, some ornamental, some readable, some not, some characteristic, but not in character with the drawings, some laborious, others rather rough. Many hold that they should be roughly and quickly written, so as to take away attention from the drawing as little as possible, but we frequently see them done a little too carelessly; at the same time the printing of plans, and especially elevations and headings, is in the writer's opinion very much overdone in architectural work, and at a great loss of time. It need not be carelessly done, for if so attention would be drawn to it and away from the drawing. The novice is recommended to adopt a legible quick style, and not too ornamental. A free engrossing style with Gothic character will suit most plans, for which, if large as in headings, use an extra-broad J pen, or Wolff's parcel pen, small size.

DRAWING MATERIALS.

It is almost impossible to make a first-class pen-and-ink drawing on ordinary paper. The best hand-made and smooth paper is required, not hot-pressed, fairly thick, and strained on the drawing board.

To strain it, turn up half-an-inch border of the paper all round. Soak the back only of the paper well with clean water. Paste down the border all round on to the board. Go over the front side of the paper very lightly with water brush and allow to dry, the board being laid down quite flat and not sloped in any way. The air in the room should be very dry, not damp.

Drawings look very well when the Indian ink is mixed with lamp-black, which gives it an intense blackness not to be obtained by Indian ink alone. They also look very well when inked-in with liquid brown ink, and touched up in thin washes of the same colour. This ink has been the fashion lately. The novice is recommended to try burnt sienna.

Chinese white often gives life to a drawing, but too much of it gives a very chalky and made-up effect; better not use it at all.

Ox-gall in the liquid state is best, and not apt to get dirty or discoloured. If too much of it is used in the ink it will blot and splash. If the paper becomes greasy anywhere, it is better to wash it lightly with diluted ox-gall in water than to use ox-gall in the ink.

In drawing large perspectives, it is always found that a vanishing point, or both, lie far outside the limits of the drawing board. A centro-linead is employed to meet this difficulty, or a very long lath or straight edge.

A very simple plan to make a temporary centro-linead is shown on Fig. 12, Part II.

Draw a curve anywhere on the board with a vanishing point as a centre. Fix two pins on this curve equidistant from *A*, under and over the horizontal line ; then cut out the dark piece in cardboard and fix it to the end of a T square, so that the curved part of cardboard can work on the pins in drawing board.

It is evident that each new perspective will require a new curve cut out for it, as the vanishing points will of course be different.

ELEMENTARY RULES AND INSTRUCTIONS.

PART I.

TO PREPARE A SMALL PERSPECTIVE OF A HOUSE.

Fig. I.

Make a ground plan of the building and pin it on the drawing board as shown on Fig. 1, and place it at any convenient angle.

Rule I.—On the lower half of the board, pin on a sheet of clean drawing paper. With a ⊢ touching the nearest main angle or quoin of building, draw a *ground line* as at *E*, Fig. 1, and continued to *S*, S^2, Fig. 2.

Divide the clean paper into three parts, and at the first division draw with a ⊢ *horizontal line* on the clean paper.

With ⊢ and set square draw on to the clean paper a *height line* through the quoin of building where it touches the ground line as at *E*, Fig. 1.

Fig. II.

Place the spectator on station point, *X*, Fig. 2, in any convenient position on the board.

Rule II.—The spectator, *X*, as a rule should be distant from *E*, Fig. 2, about three times the height of the building to the eaves or parapets; but this, of course, may be varied to obtain particular views, and the novice is recommended to try a few examples in outline for himself to see the effect.

Having put on the ground line and horizontal line, and fixed the spectator, it is now required to find the vanishing points.

Rule III.—Draw *X* to *S* parallel to the front of the building *HE*, Fig. 2, cutting the ground line at *S* and mark it, for it is often beyond the boundary of the drawing board. From *S* draw a vertical line till it cuts the *horizontal line* at *M*, Fig. 3. It will be necessary to fix *M* to the board in the most convenient way, or a centro-linead will be required as before described, also illustrated at the end of Part II.

Having found and fixed one vanishing point, proceed in like manner to find the other, *N*.

Draw *X* to S^2 parallel to the side of the building *EF*, Fig. 2, and draw down the vertical line to *N* and fix this point. *M* and *N* are then the vanishing points.

It makes no difference what the object is you are about to draw, it may be a chair, a table, or a regiment of soldiers; the same rule must be followed, that is, a plan made of them and placed as directed, and the vanishing points found as described; ground line and horizontal line in similar manner.

FIG. III.

Rule IV.—All lines on the plan parallel to *EH*, Fig. 3, and parallel to each other must be drawn in perspective to the vanishing point *M*. In like manner all lines on plan parallel to *EF*, Fig. 3, must be drawn to the vanishing point *N*.

Other vanishing points may be required, which will be referred to later on.

FIGS. III. AND IV.

Rule V.—From all points on the plan which will be seen in perspective lines must be drawn to the spectator *X*, Fig. 3, such as gables, roofs, windows, porches, doors, chimneys, and everything that makes up the design whatever it may be, and cutting the ground line as in Fig. 4, at which line they must stop and not continued to *X* as in Fig. 3.

All details must be treated in like manner, and everything truly drawn on plan before being projected as described.

FIG. IV.

It is best to complete the outline before commencing any detail, for it occurs at times, and especially so with the novice, that something is not seen which is required in the view, or perhaps the proportions of the drawing or position of spectator are not satisfactory, which in some architecture, such as the half-timbered style, is very important.

Having found and projected the plan and everything on it required, on to the ground line, draw them down vertically on to the clean paper as shown on Fig. 4.

Before proceeding further refer to the elevation, Fig. 13, and draw a *horizontal line* at any distance over the ground, say six feet, which will represent the same line *MN* on perspective.

A fair start may now be made towards drawing the perspective.

Fig. V.

Set off six feet to the ground on the main height line *E*, Fig. 5, and under the horizontal line *MN*.

Set off height to the eave of roof over same taken from the elevation.

Draw the eaves and ground as shown.

Note the various returns to both vanishing points, Rule IV., and how they cut the different vertical or height lines.

Fig. VI.

Now proceed to the roof.

Make a correct plan of it—a tracing will do—and place it over the ground plan Fig. 1, and project all gables, &c., as before mentioned: note that they overhang the main walls. Set up height of gables on line *E* taken from the elevation. Return to vanishing point, Rule IV., cutting *ABC* and join the gables as shown.

Fig. VII.

Project remainder of the roof and complete as shown, and note the Rules, especially IV.; note well how the vanishing lines cut the projected lines from plan at *ABC*.

FIG. VIII.

If the roof be hipped, make a correct plan and project hips, and plane of same from plan at *D*. Set up height of roof on *E*, return to the vanishing point as shown, cutting *ABC* and join the hips.

FIG. IX.

Plot the windows truly on plan with reveals, mullions, &c. if any, and project. Set up the height from elevation on *E*, and proceed as shown. Keep to the Rules, especially IV.

The recessed windows could have been obtained by continuing their correct plane at *D* on plan and projecting it, but it is evidently not required in this example.

FIG. X.

Project the correct plane of the chimneys from plan at *D*, set up on *E* height from elevation, return to vanishing point cutting *A*, return to vanishing point cutting *BC*, and complete in similar manner top and bottom of chimneys as shown.

FIG. XI.

A few diagrams will now follow to meet the occasional difficulties to be found in every perspective.

We will commence with a square bay window.

Set up heights on *E*, return to the vanishing point *M*, Rule IV., cutting *A*; return to the vanishing point *N* cutting *B*, and so on; same for the ground line. Note the direction of all planes on *plan*, and keep Rule IV. well in mind.

Fig. XII.

In a canted bay window, follow the previous example.

Rule VI.—All sides parallel to the point of sight *X*, or *nearly so*, as in this diagram at *A*, to be drawn parallel with a ⊢ as shown.

Rule VII.—If a line or plane occurs which is not parallel to either *EH* or *EF*, on plan, Fig. 2, and not parallel to the spectator, as in Fig. 12, Rule VI., the last rule will not do for it, nor the vanishing points *M* and *N*. But a new and extra vanishing point must be found for it especially, and by following Rules III. and IV., Figs. 2 and 3. For a further illustration of this Rule, see Fig. 25.

Fig. XIII.

This elevation refers to Figs. 1 to 10.

Fig. XIV.

This is an example of a square tower.

Set up heights on *E* of the various planes as shown, and cutting the projected lines *ABCD*. Join angles of tower with *D* for roof.

Fig. XV.—*For a Circular Tower.*

Enclose the tower in an imaginary square, and proceed as in the previous diagram. Draw the curves by hand through the points *ABC* as shown. Join *ACD* for a conical roof like a sugar loaf.

Fig. XVI.—*For a Semi-circular Bay Window.*

Project as in the last diagram. Project centre of the bay at *B* on plan. Draw curves through *ABC*. Join *ACD* for half of a conical roof.

Fig. XVII.

Parallel square bay window further illustrating Rule VI. Set up heights on *E* and draw with a ⊢—.

Fig. XVIII.

These are elevations in connection with Figs. 11 to 17, excepting Fig. 13.

Fig. XIX.

Bay windows, porches, or other projections beyond the ground line on plan as in this diagram, must be projected back on to the ground line as shown at *AA*, and follow Fig. 4 as usual.

Fig. XX.

If time is an object and the draughtsman has some skill, a large perspective may be prepared from a small plan, if accurate, in the following way.

If *HEF* be the plan, follow Rule I., Fig. 1. Draw from station *X*, through points *EF*. Make *AA* on the new ground line, say, twice the length of *AA* on the old ground line at *E*, then follow Fig. 4.

Everything must be projected back from the small plan on to the new ground line; and all elevations, if drawn to the same scale as the small plan, must be taken as twice as large for true heights for the enlarged perspective.

Fig. XXI.

To obtain a bird's-eye view, the vanishing points are placed at will at any height—in this diagram about 80 ft. over the ground.

Fig. XXII.

If the spectator and house be on a hill, and he is looking up at it.

The vanishing points are placed at will at any height below the *horizontal line*—in this diagram about 20 ft.

Plate V. illustrates this more completely, and (at the same time) a peculiarity arising out of the actual plan of the building (see Fig. XXV.), from which it will be observed that four main vanishing points are required (see Rule VII., page 30). This results in a curious development of the elevations in the drawing—an arrangement sometimes resorted to purposely by the draughtsman without reference to the exact plan of the building, but simply to obtain the effect in elevation here shown. Being an exaggeration of the true plan, it should never be overdone.

Fig. XXIII.

A diagram showing the effect of placing the station point *X* too near *E* on plan. In this diagram about twice the height to the eaves of roof.

Another diagram, about four times the height to the eaves, which appears in better proportion.

Fig. XXIV.

This diagram is simply drawn with the aid of a ⊢ and set square of 45°, no vanishing points being required.

Refer to the plan and elevation given in Part I.

Draw each face of the building to their true sizes taken from the plan.

Put up all heights to their true sizes, and draw in everything with an angle of 45°, both faces of building. And the whole should be complete to scale, and the size of any door, window, &c., ascertained.

This arrangement is often useful, but, of course, being untrue as a perspective, is extremely ugly.

For extensive farm buildings, machinery, and even furniture, it may be frequently seen.

Fig. XXV.

This Figure, and Plate 5, further illustrate Rule VII., showing that four main vanishing points are required, arising out of the actual plan of the building.

PART II.

THE WHOLE COURSE OF DRAWING A HOUSE IN PERSPECTIVE.

The student is recommended to acquire a thorough understanding of all the elementary rules and diagrams of Part I., before entering on this course of detail diagrams.

Part I. forms the essential matter of the subject and must be always followed as shown, not only in the workings of this design, but in every other as before mentioned.

In commencing the workings of this design, we must follow the first three diagrams of Part I., that is, to make a true plan as shown on Plate 2. To choose a point of sight, and to find the vanishing points. To keep the rules, which are few, well in mind, and complete the outline of the perspective as shown on Plate I. To gradually work the perspective up in detail as instructed by Part I., and finish the drawing to the best of our ability, and knowledge of building construction.

No trees or figures should be attempted on the first few trial perspectives; nothing but the building, and that as fully in detail as possible.

FIGS. I. AND II.

Are elevations of the building which will be seen in the perspective, and are drawn *half the size* of the general plan.

Note.—All heights, therefore, taken from them must be doubled, to be in agreement with the scale of the plan.

FIG. III.

Note Rule, Fig. 12, Part I.

Note the roof is circular.

Note *N* centre line on wall face.

The side *A* is not parallel to any line on plan, and the Rules in Part I. must be followed as described, to obtain another vanishing point for it. This is seldom done in practice, unless on a very large scale drawing, as it can be very well put in by eye.

FIG. IV.

B is the height of gable on the face of wall. Roof projects from *E* to *B*. Gable projects at *A*.

Note Fig. 17, Part I.

FIG. V.

The gable projects from *A* to *B*.

B is the height of gable on wall face.

Note Rule, Fig. 12, Part I.

See Fig. 9, Part I.

Fig. VI.

AA on plan are the centre lines of the tower walls. The recessed roof goes back to *K*. Join *XX*. Join main gable.

Join 1 2 3.

The roof projects from *M* to *A*.

Note.—This diagram is reduced in scale.

Fig. VII.

The gablet projects from *K* to *N*. See plan, previous Fig.

See plan; and from *A* to *N*, beyond the face of the main wall.

Note *EE* is on the same face as the tower wall. See the general plan.

Fig. VIII.

Notice how the point at *B* is obtained. See plan, previous Fig. *AC* are on the same plane, and the centre line of the tower walls.

The dormer projects from *A* to *F*. See plan, previous Fig

The roof of same to *H*.

Join 5 5.

Fig. IX.

The projection, &c., of the porch requires no further explanation than shown by the diagram.

Fig. X.

Note Rule, Fig. 12, Part I.

Fig. XI.

Join *AB* and *CDF*, *EF* and *GH*. Form curve through *AXH*, at eaves, and *IM*, 3, &c.

The bay projects from *M* to *N*.

N is the centre line of bay on wall face.

SS, centre of dormer.

See Fig. 19, Part I.

Fig. XII.—*Centro-linead.*

A description of this diagram will be found under the head of "Materials."

Plate VI.—*Linear Perspective of Room.*

Make a plan in detail and place it at any angle to the spectator. Draw horizontal and ground lines as described, and find the vanishing points as before directed, and as shown on Figs. 2 and 3, Part I.

To show a portion of a room, this way is better than by parallel perspective; but where a whole interior is required, as in the view of a church, it cannot be done by linear perspective.

Of course, a plan or tracing of the ceiling or roof, or whatever it may be, must be very correctly drawn and placed in its proper position over the ground plan; and beams, panelling timbers, lanterns, domes, in fact everything in the design must be projected in the usual way on to the ground line, &c., as described.

PART III.

PARALLEL PERSPECTIVE.

To give a more complete practical outline of architectural perspective this part of the subject will be found necessary; and perhaps it will be found acceptable to many young draughtsmen, who have not the opportunities or time for going through the ordinary slow routine of the teacher.

It is desirable to learn linear perspective first and get familiar with it, before taking up this part, which is not so often required in practice.

It requires, however, very little study, being much simpler than linear perspective, and may be very quickly understood and followed by the novice.

To make a perspective of a room or any interior, the first thing necessary is a correct plan of it in detail, showing all projections, pillars, beams, sky lights, lanterns, domes, furniture, and figures, all truly drawn in their positions.

Having made a plan, next proceed to draw a line through it, cutting off as much of the room as required or thought desirable, to be shown in the perspective.

Then decide upon the position of the spectator, with reference to the notes under the head of Drawing; place him anywhere at random, near or distant, but note the effects of doing so either way in all the following diagrams, from which should be gathered the different effects. Figs. 2 and 3 are in best proportion, but in one case he is placed rather too near the centre line of room, and in the other rather too far to one side. The distance he is from the ground is about correct in both.

Draw a horizontal line through the elevation of the room about the height of a man, say five or six feet, or either more or less according to the view required of the floor or ceiling (see notes on Drawing).

Fig. I.

Having provided a clean sheet of paper on the drawing board, divide it horizontally with a line to represent the same line drawn on the elevations.

Now project to the spectator on plan everything in the room that can be seen and cutting the *ground line.* It would be well to do the outline first and fill in as required.

Draw up vertical lines from the sides of the room where they *cut the ground line,* on to the clean paper. In like manner the two ends of the room where they cut the ground line. One of the vertical sides of the room will be the *height line,* on which all heights taken from the elevations must be *set up* under and over the horizontal line, and drawn to X on perspective and cutting the various vertical lines.

X on perspective is found by a line drawn vertically from the spectator on plan, cutting the horizontal line on perspective.

Rule I.—All lines on plan *parallel* to the spectator, to be drawn parallel on perspective with a ⊢.

Fig. II.

Note that the plan may be placed under or over the perspective and projected, and verticals drawn down instead of up. Note the intersection of lines on the ground line.

Fig. III.

This is a simple example of a projection and a recess in the room (note Rule).

Fig. IV.

In drawing circles, hexagons, and suchlike figures, make a true plan and enclose in a square or oblong figure, and project the latter first and then fill in the pattern.

Such plans, of course, may be made on tracing paper and placed over the ground plan in proper position and projected on it, otherwise the lines on paper plan may get confusing.

Fig. V.

This is an example of a room with pillars on the face of the walls, and beams across the ceiling. Note the projection at the end of the room and how it is obtained at *A*.

Fig. VI.

Figures and furniture and everything else must be drawn in their relative sizes according to their position on plan, from which everything must be projected.

Note what has been said as regards curves under Drawing (*ante*, p. 14).

FIG. VII.

This diagram shows how a large perspective may be made from a small plan. Note remarks under Drawing (*ante*, p. 15).

To enlarge a small plan, say four times, draw from spectator through *AA*, making *FF* equal four times *AA*.

Everything must be projected from small plan on to *FF*.

It is evident a reverse operation *decreases*.

If the plan here shown were drawn $\frac{1}{8}$ in. scale, the elevations if drawn to the *same* scale must be made $\frac{1}{2}$ inch scale, or every height taken from them must be increased four times.

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Fig. 1.

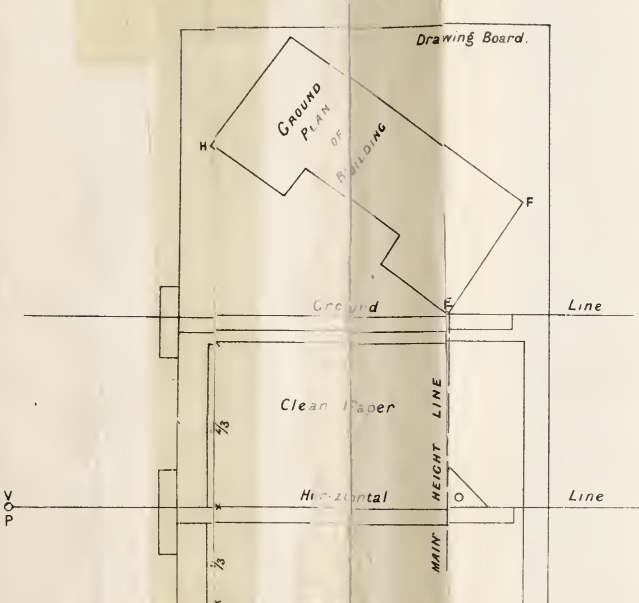
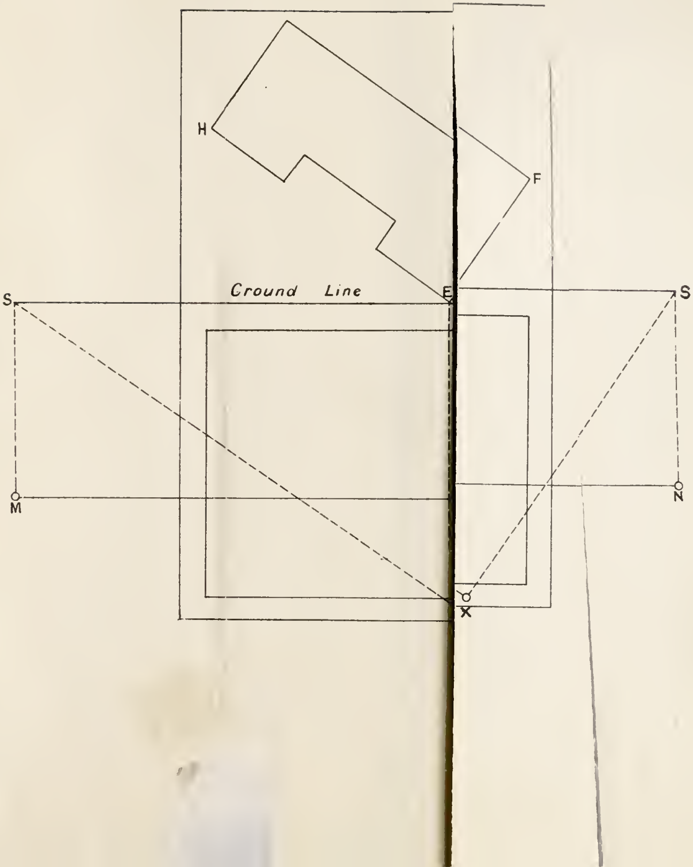

Drawing Board.
GROUND PLAN OF BUILDING
H
F
E
Ground Line
Clean Paper
MAIN HEIGHT LINE
2/3
1/3
O
Horizontal Line
V P
V P

Fig. 2.



PART I.

Fig. 4.

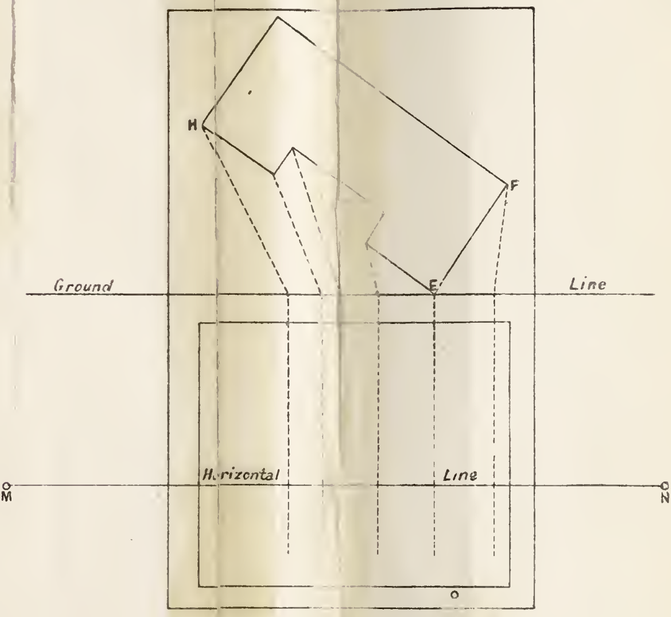
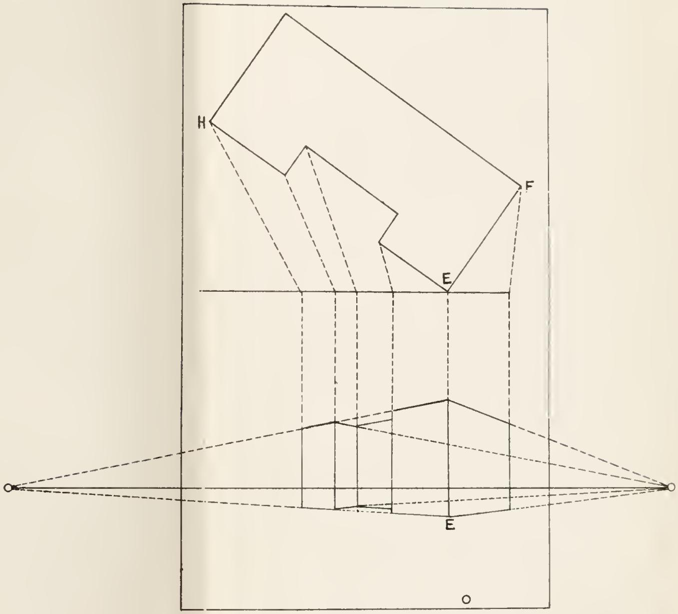


Fig. 5.



PART I.

Fig. 6.

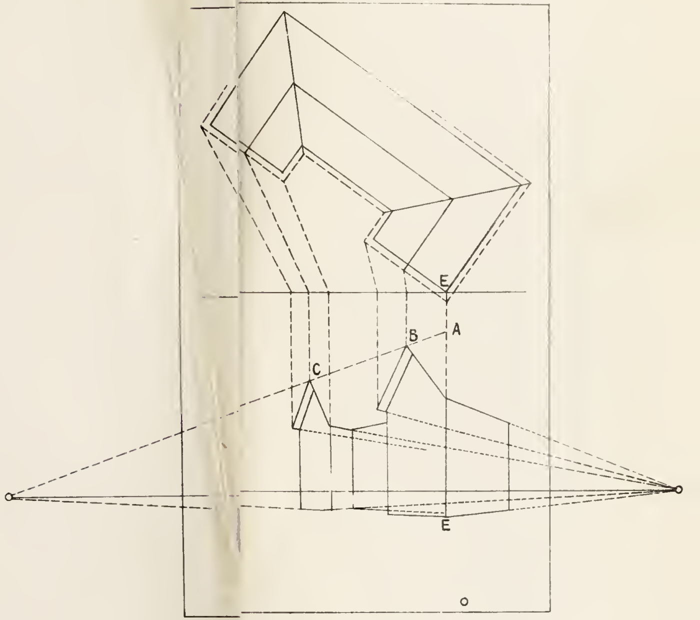
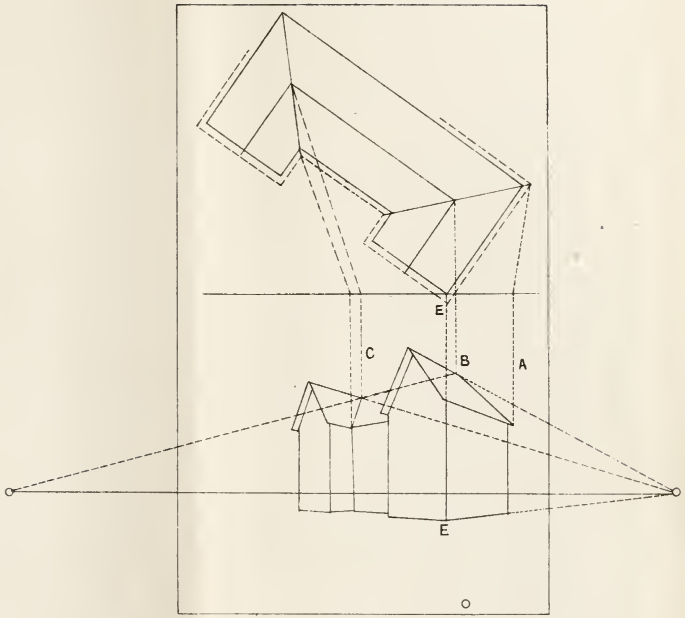


Fig. 7.



PART I.

Fig. 8.

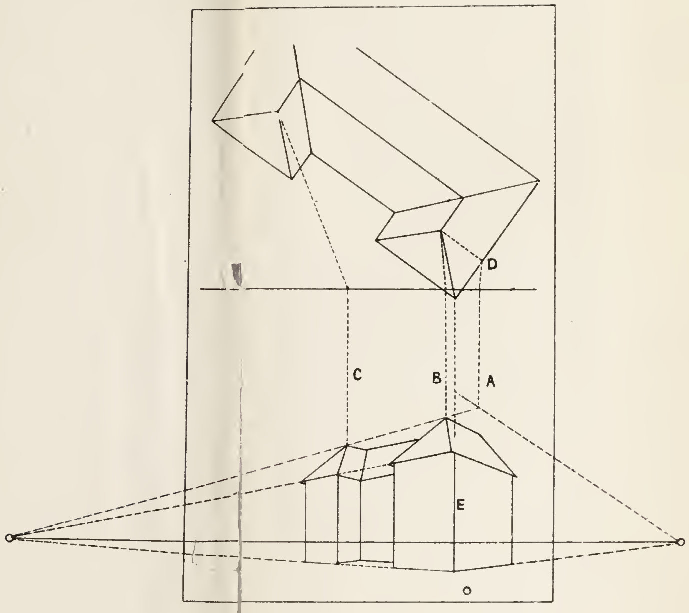
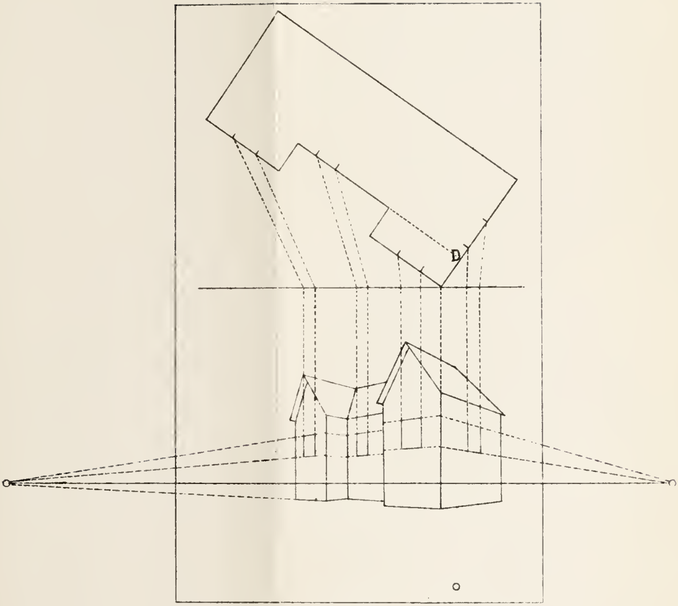
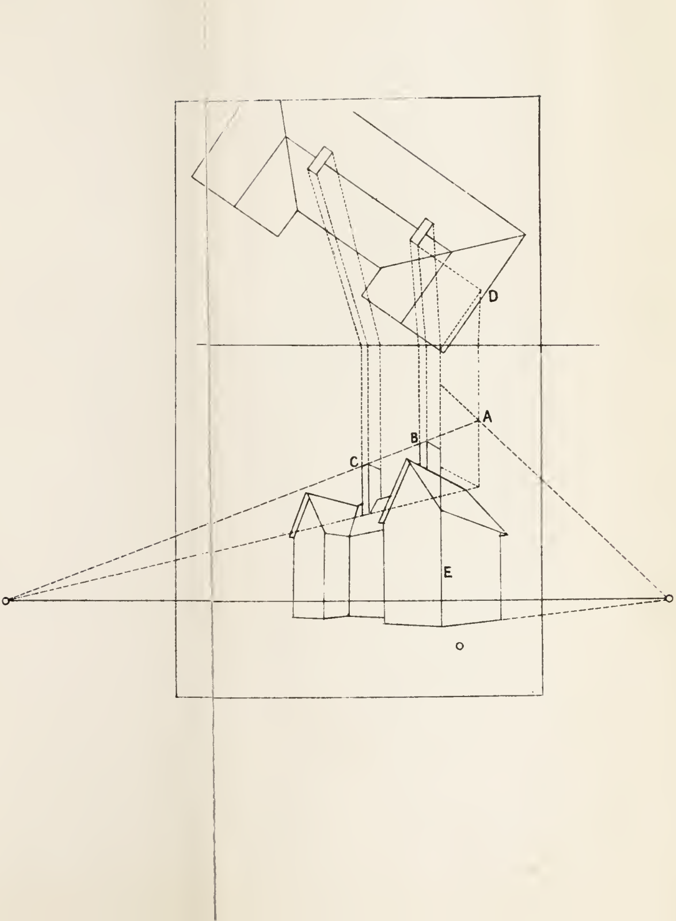


Fig. 9.



PART I.

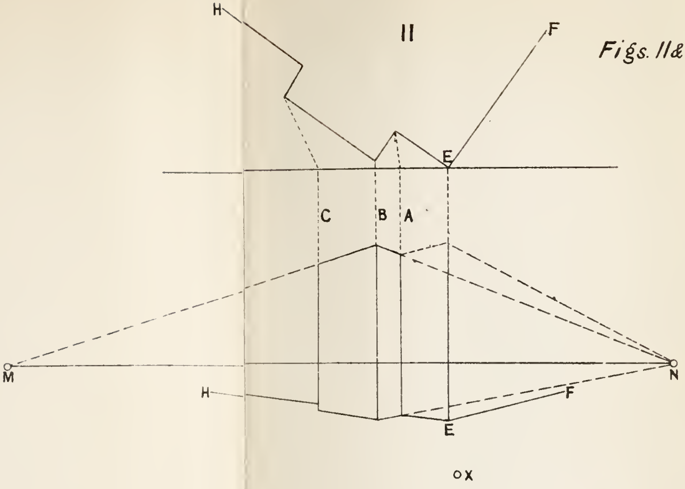
Fig. 10.



PART I.

Figs. 11 & 12.

11



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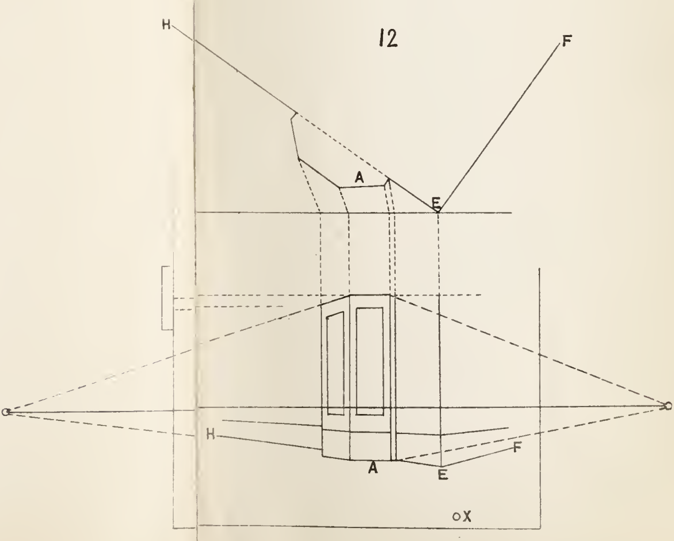
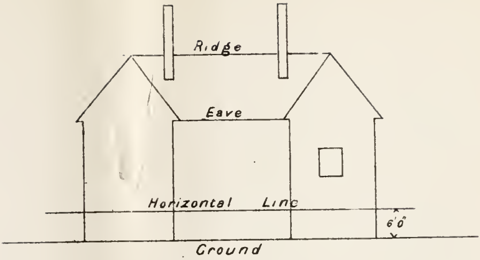


PART I.

Figs. 13 & 14.

13



ELEVATION
FIG.1 TO X.

14

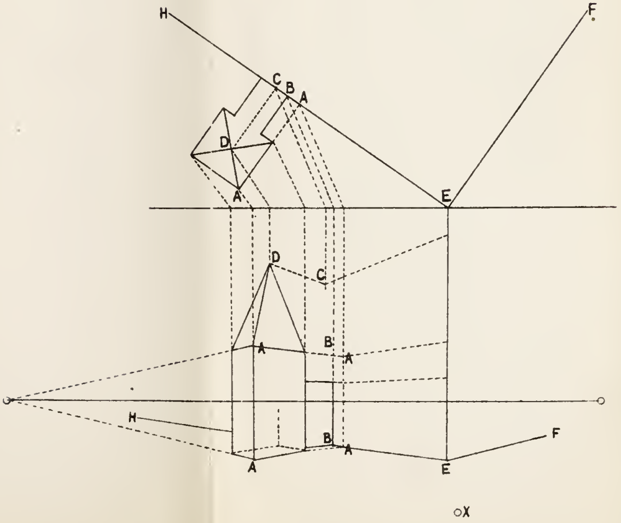
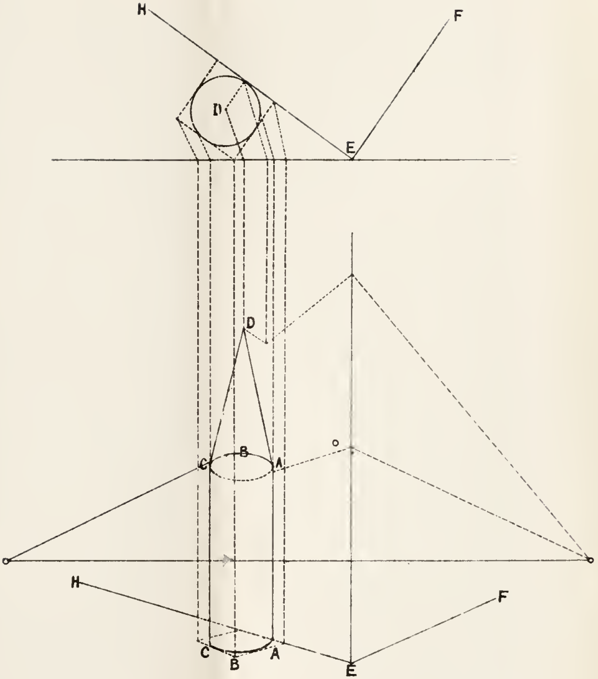


Fig. 15.



PART I.

Figs 16&17

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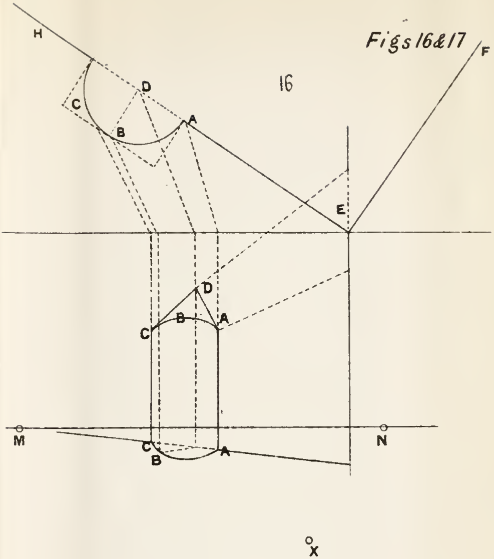

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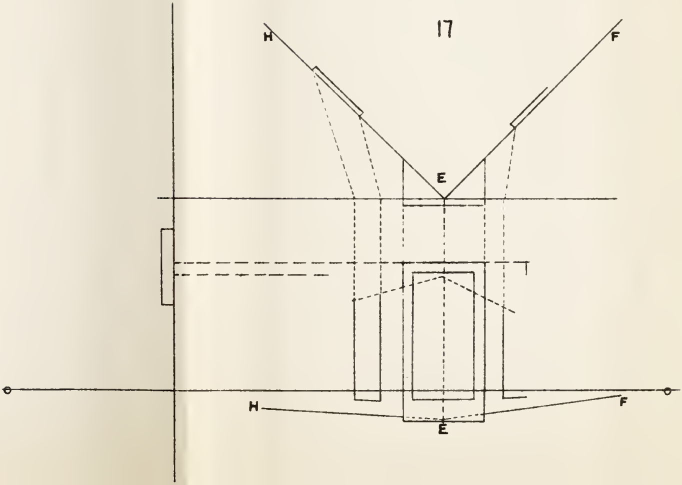
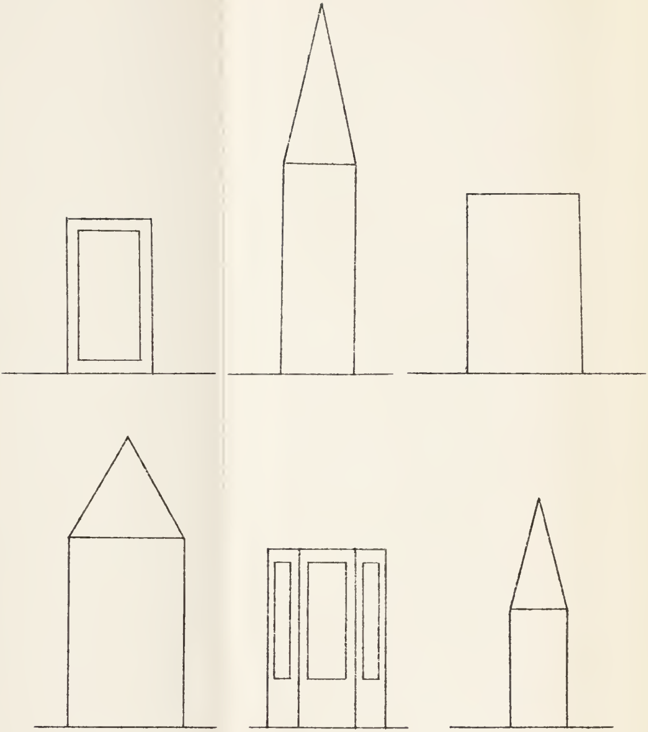


PART I.

Fig. 18.



PART I.

Figs. 19 & 20.

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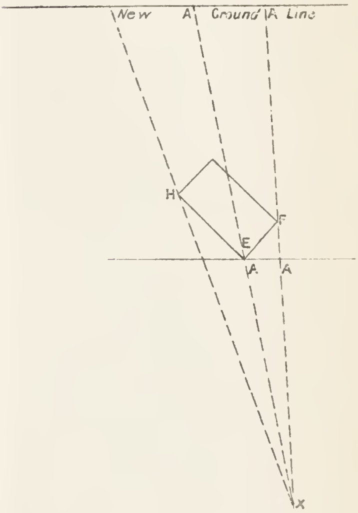

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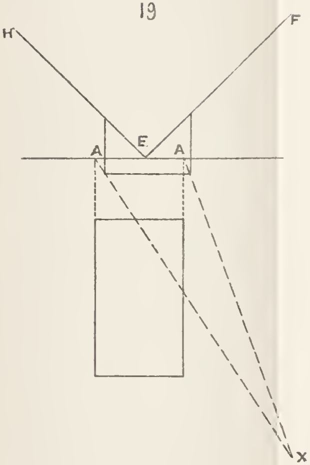


PART 1.

Fig. 21.

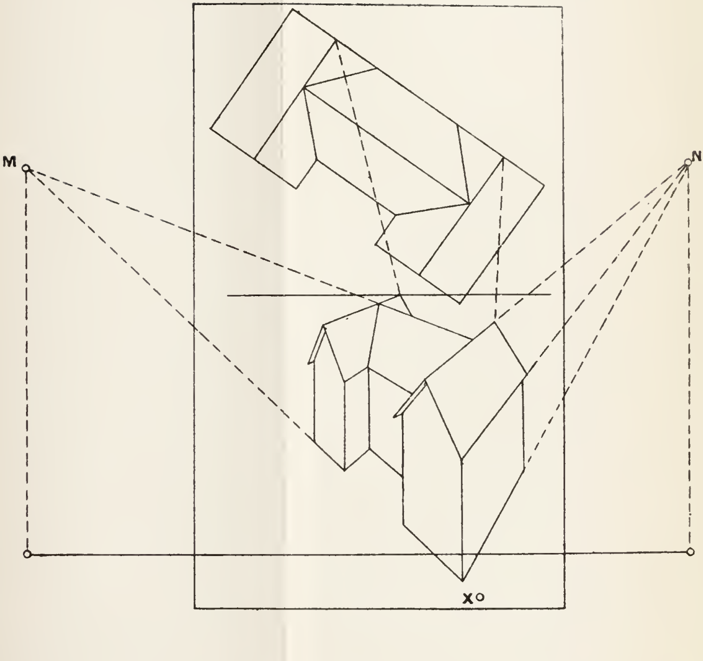
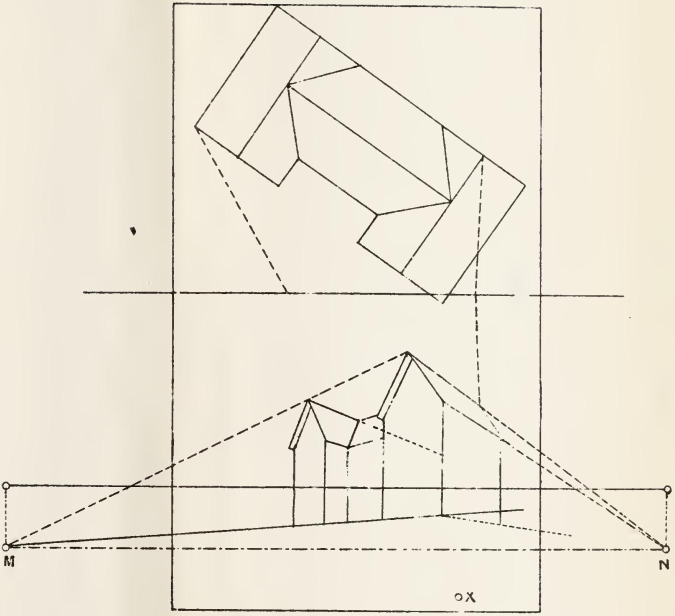
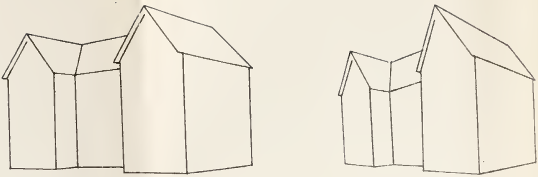


Fig 22.



Figs. 23&24.

23



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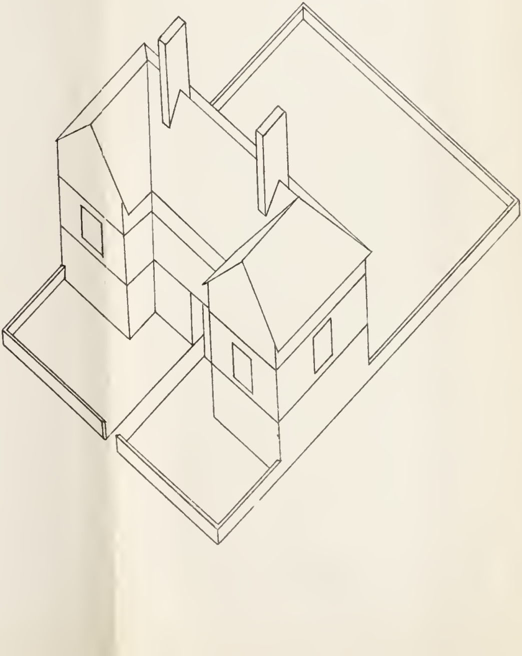
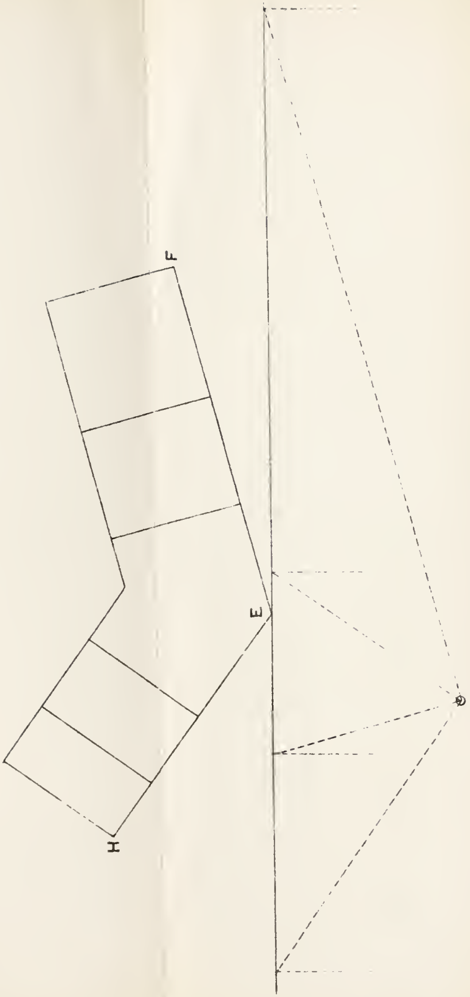


PART I.

Fig. 25.



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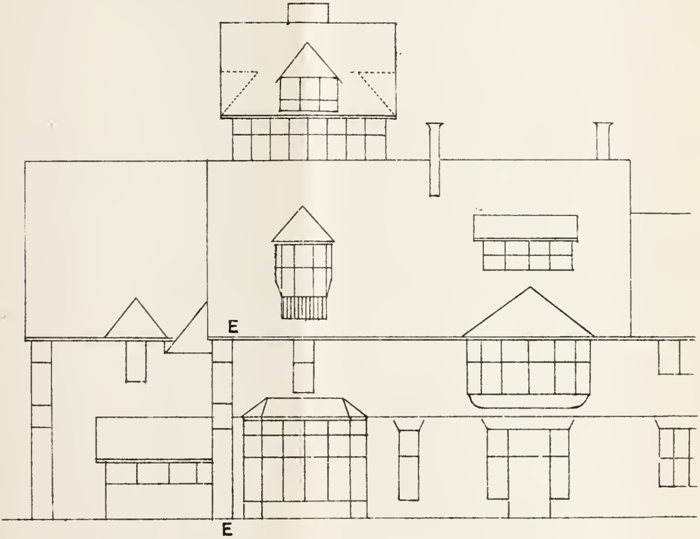
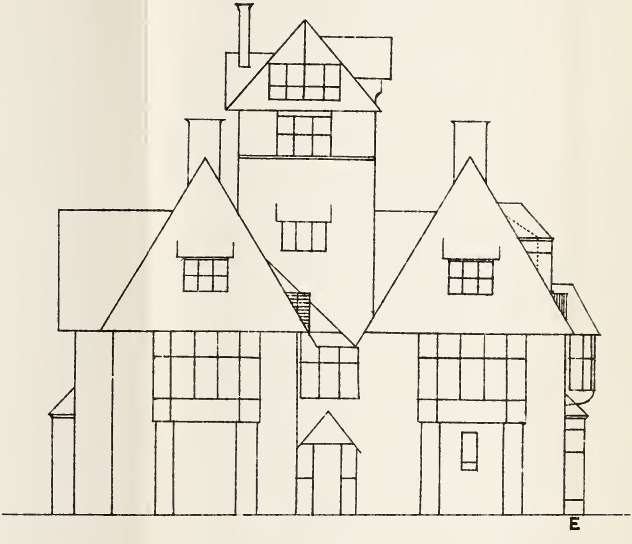


PART II.

Fig 2.



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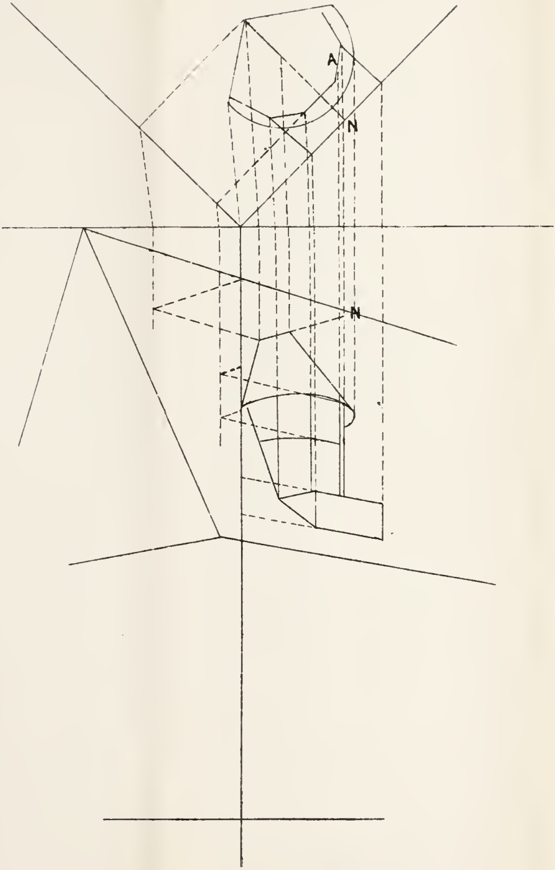
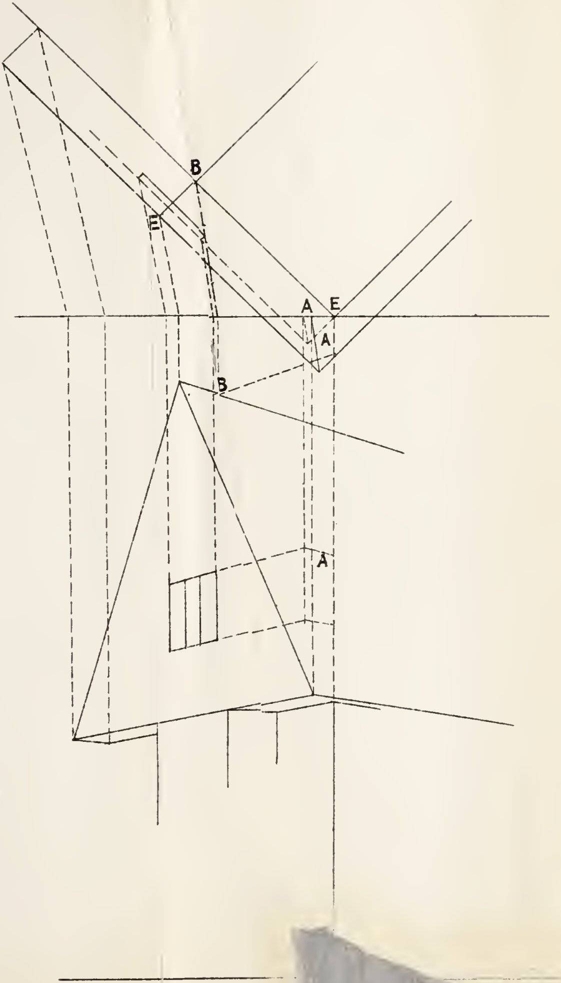


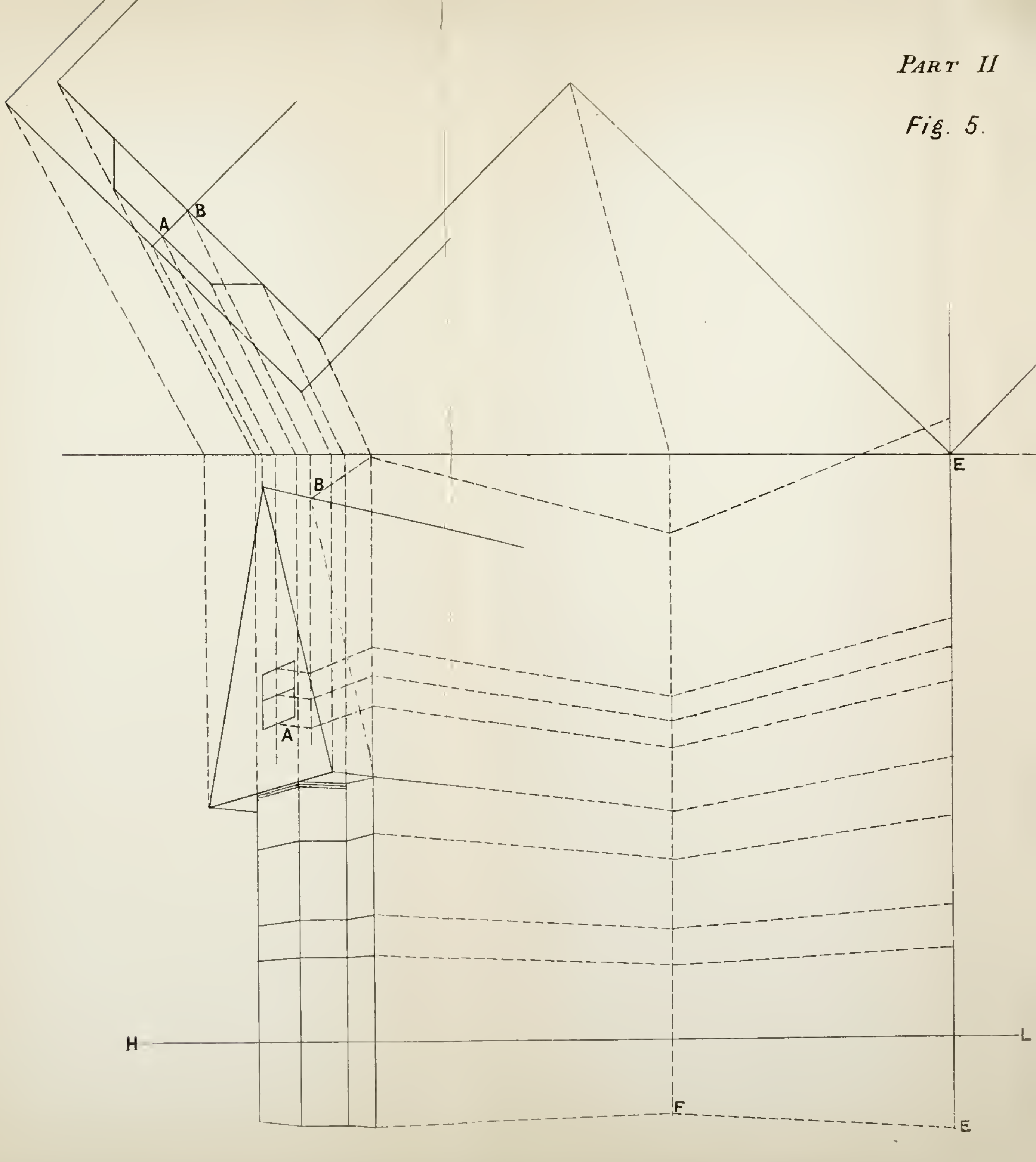
PART II.

Fig. 4.



Part II

Fig. 5.



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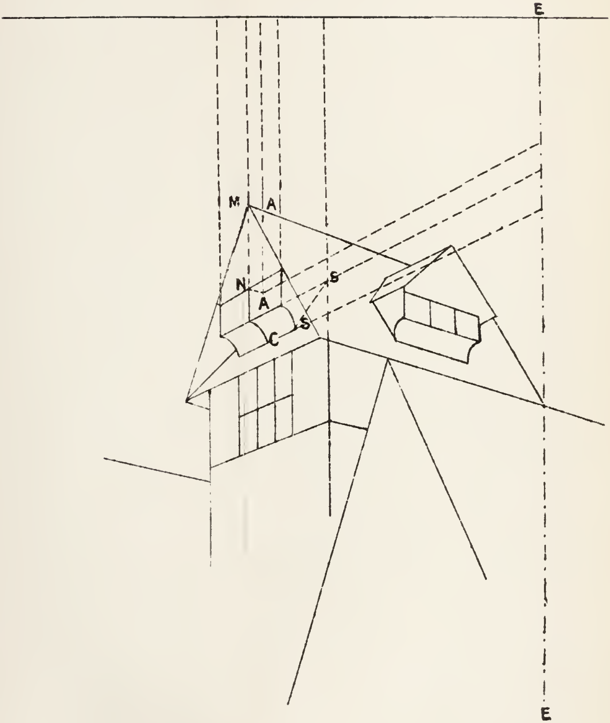

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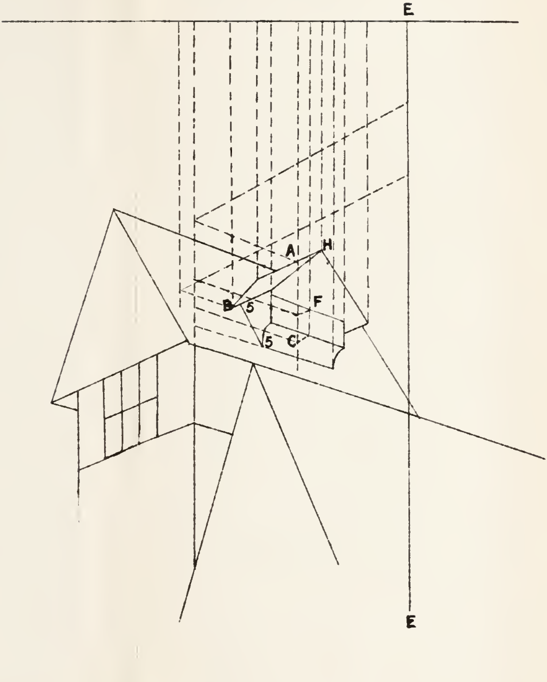

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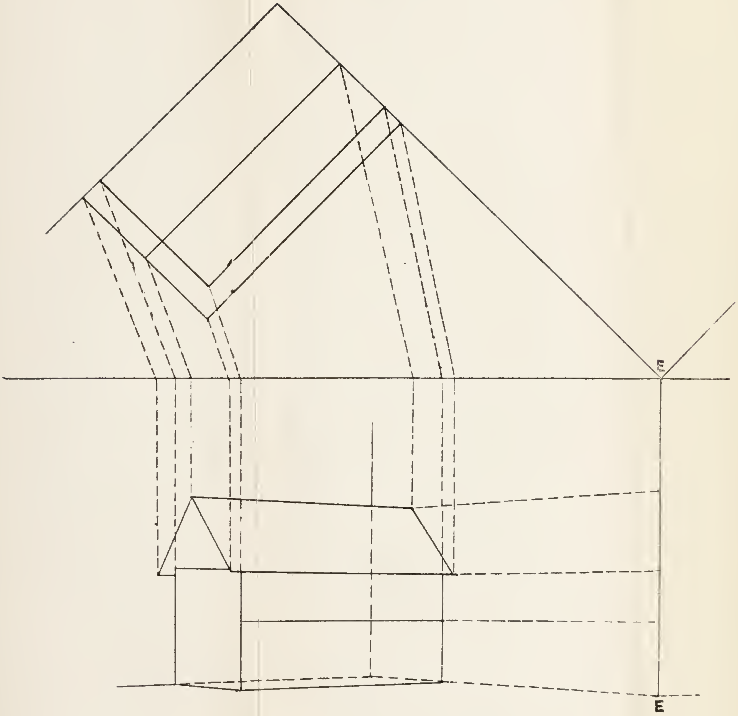


PART II.

Fig. 10.

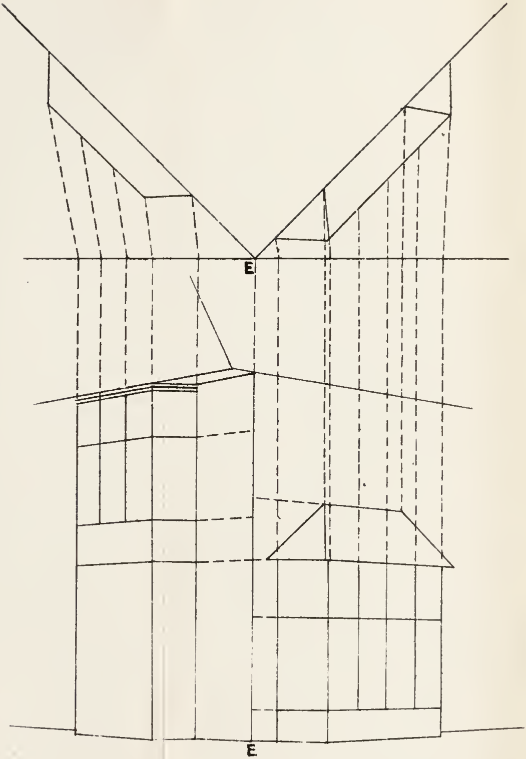
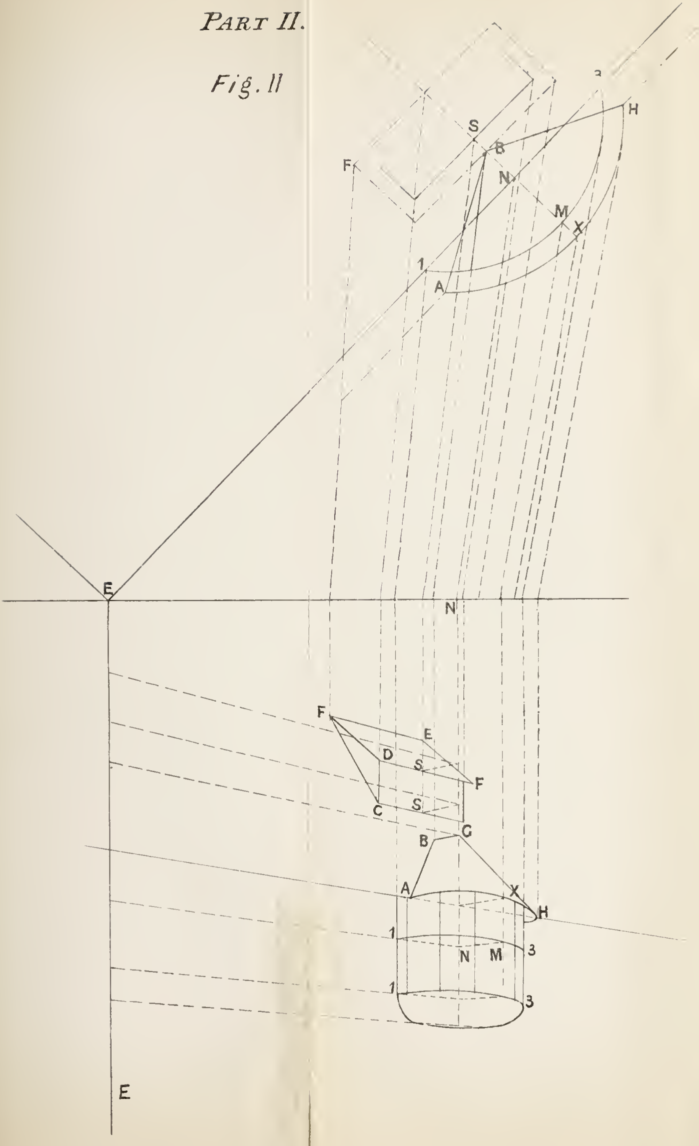


Fig. 11



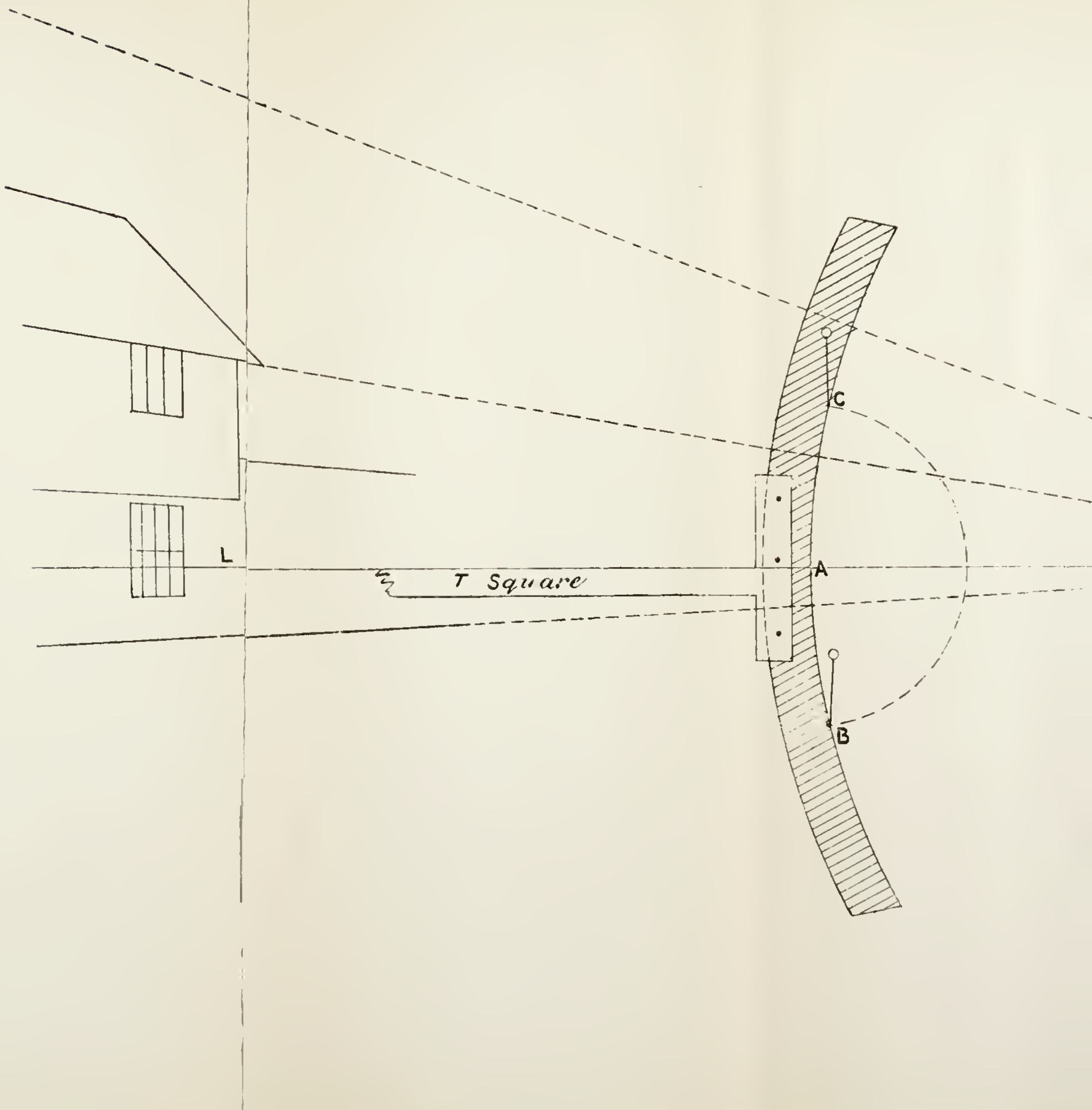
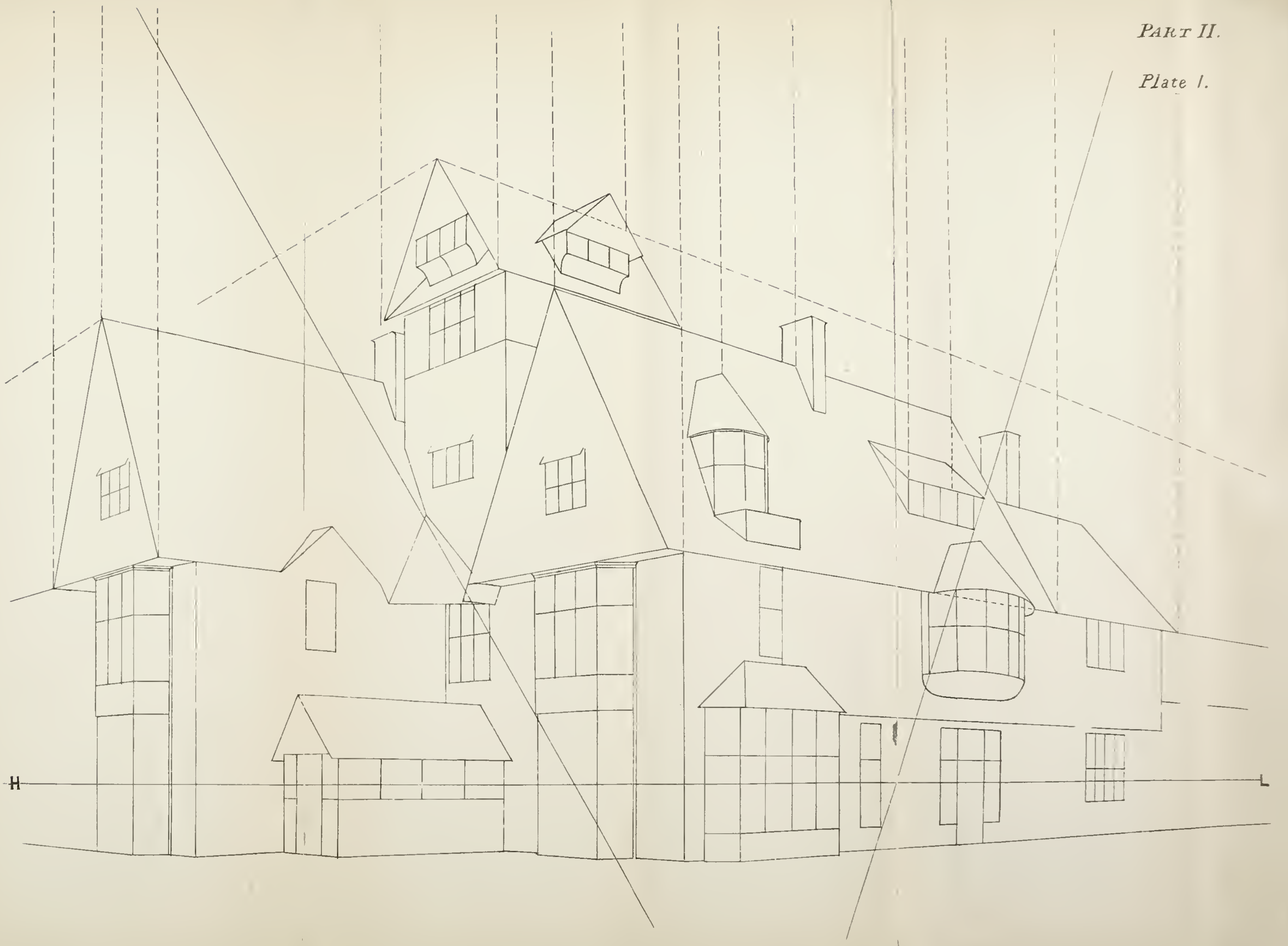
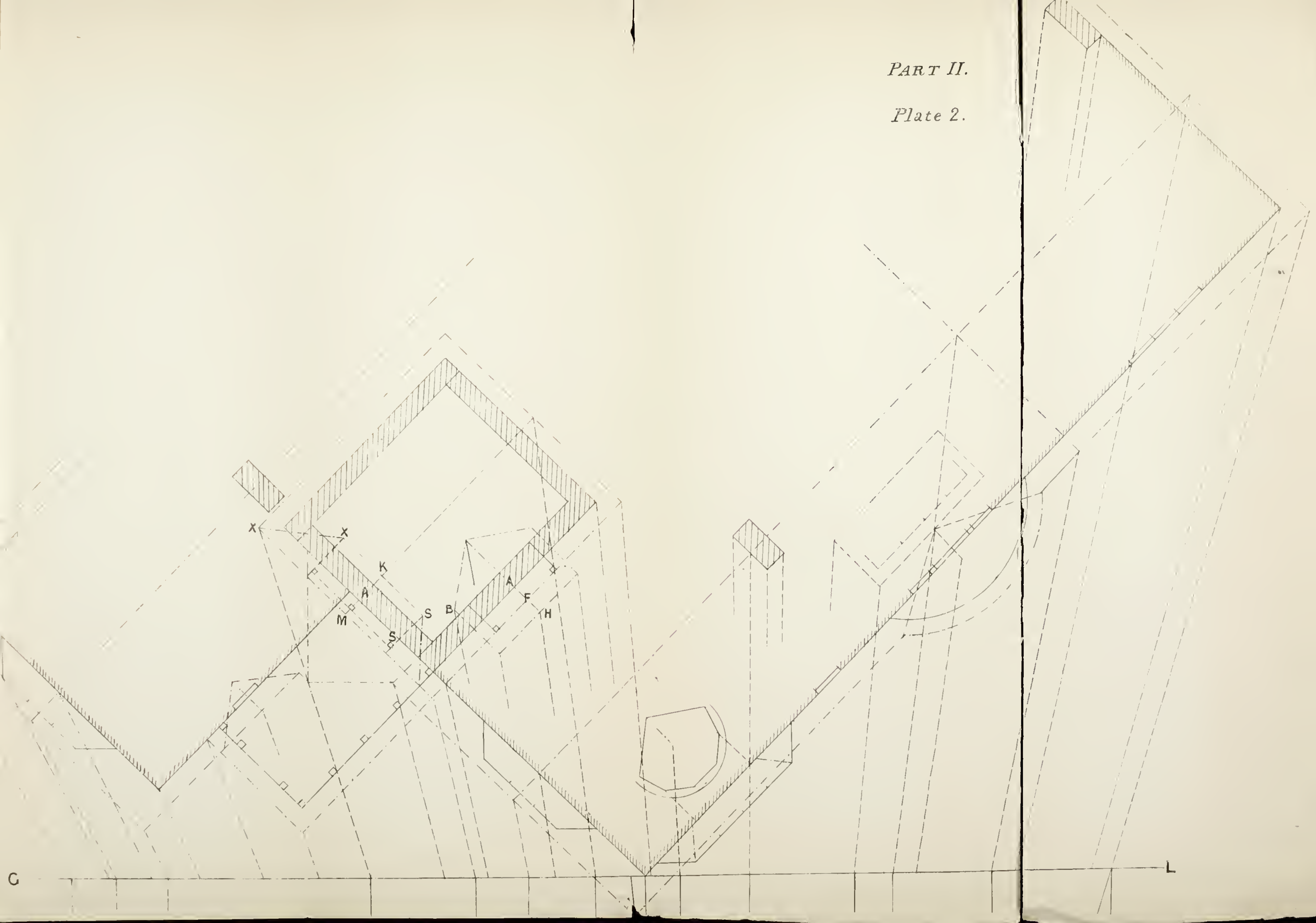

C
L
T Square
A
B

Plate I.



Part II.

Plate 2.



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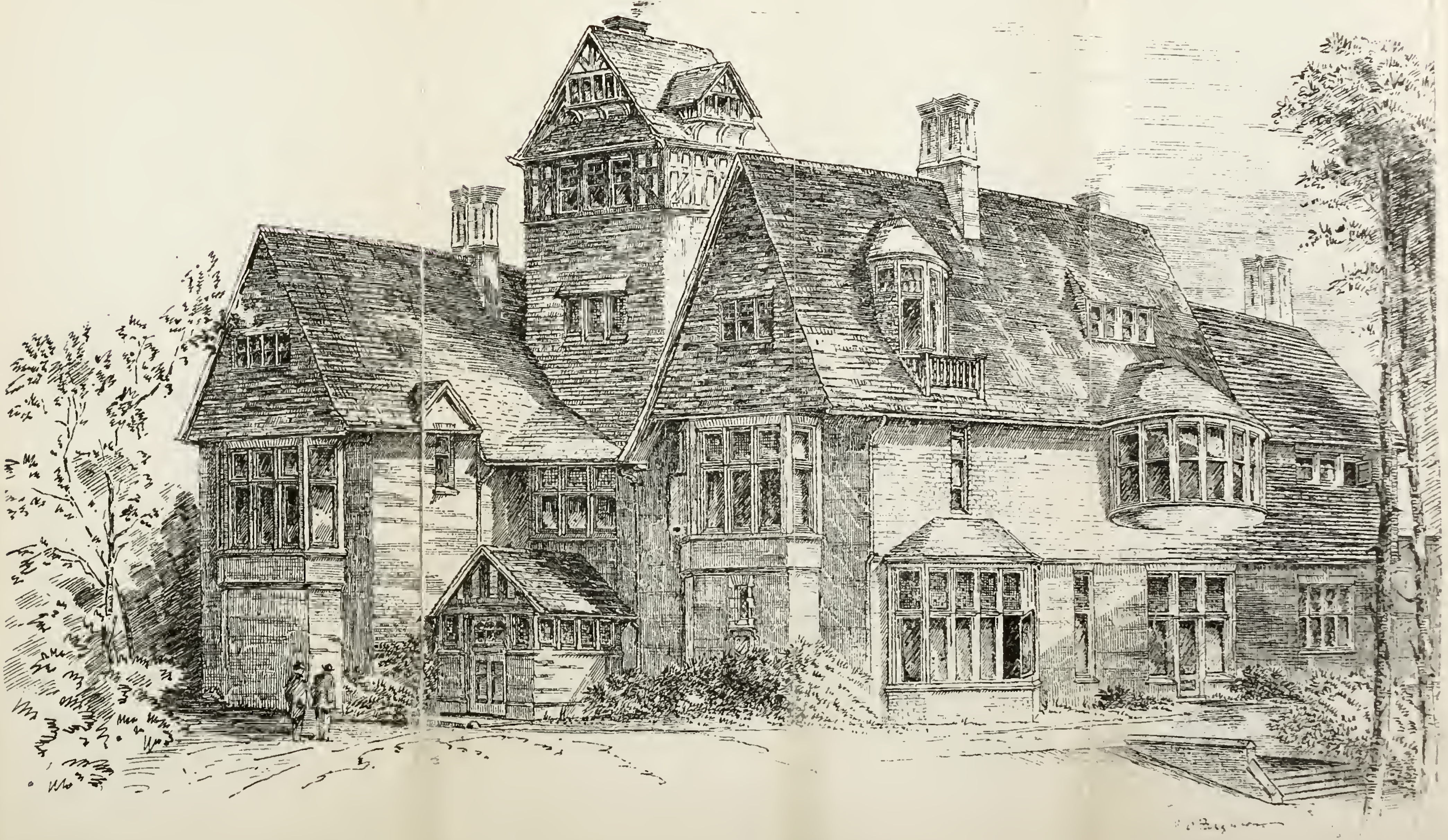
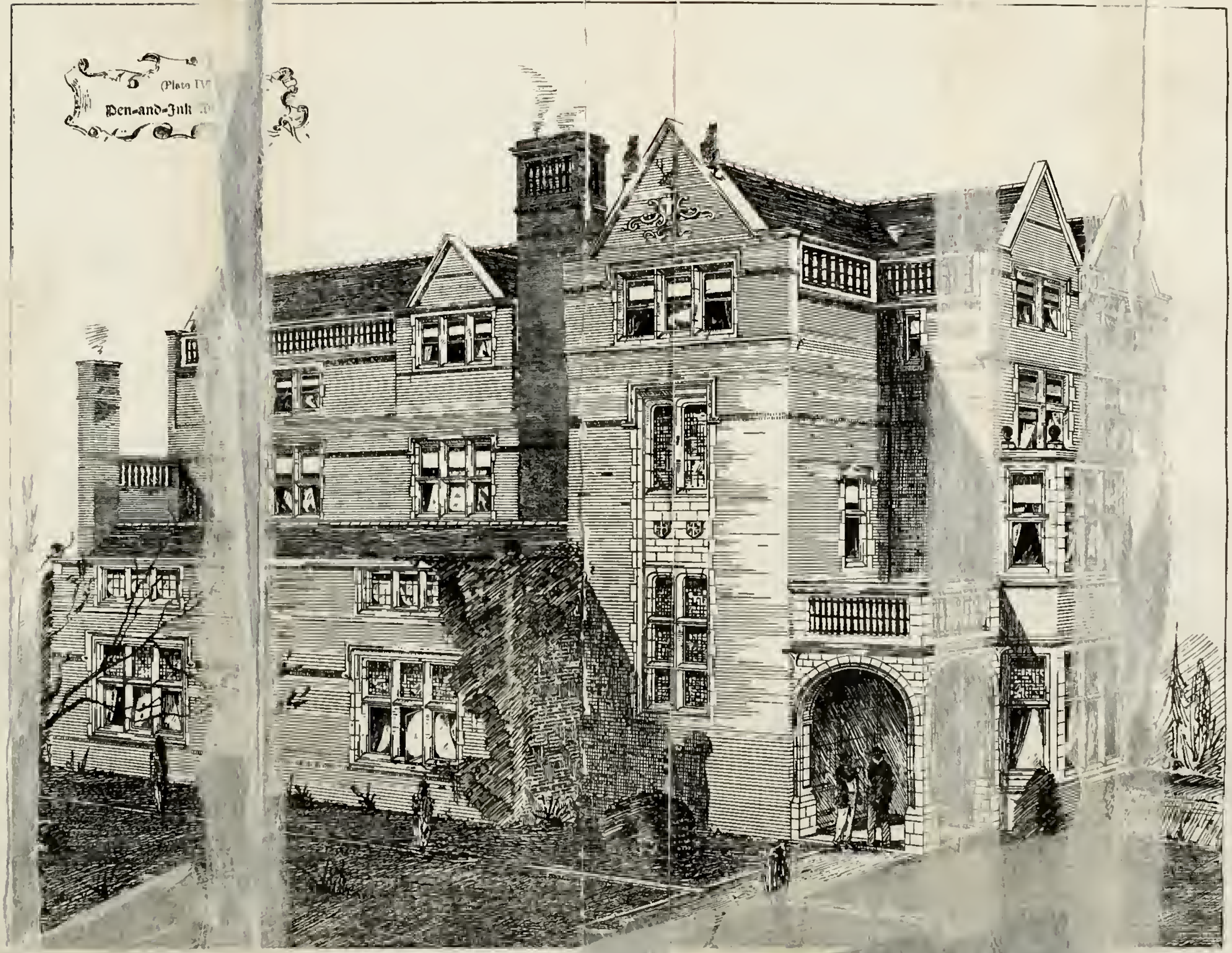
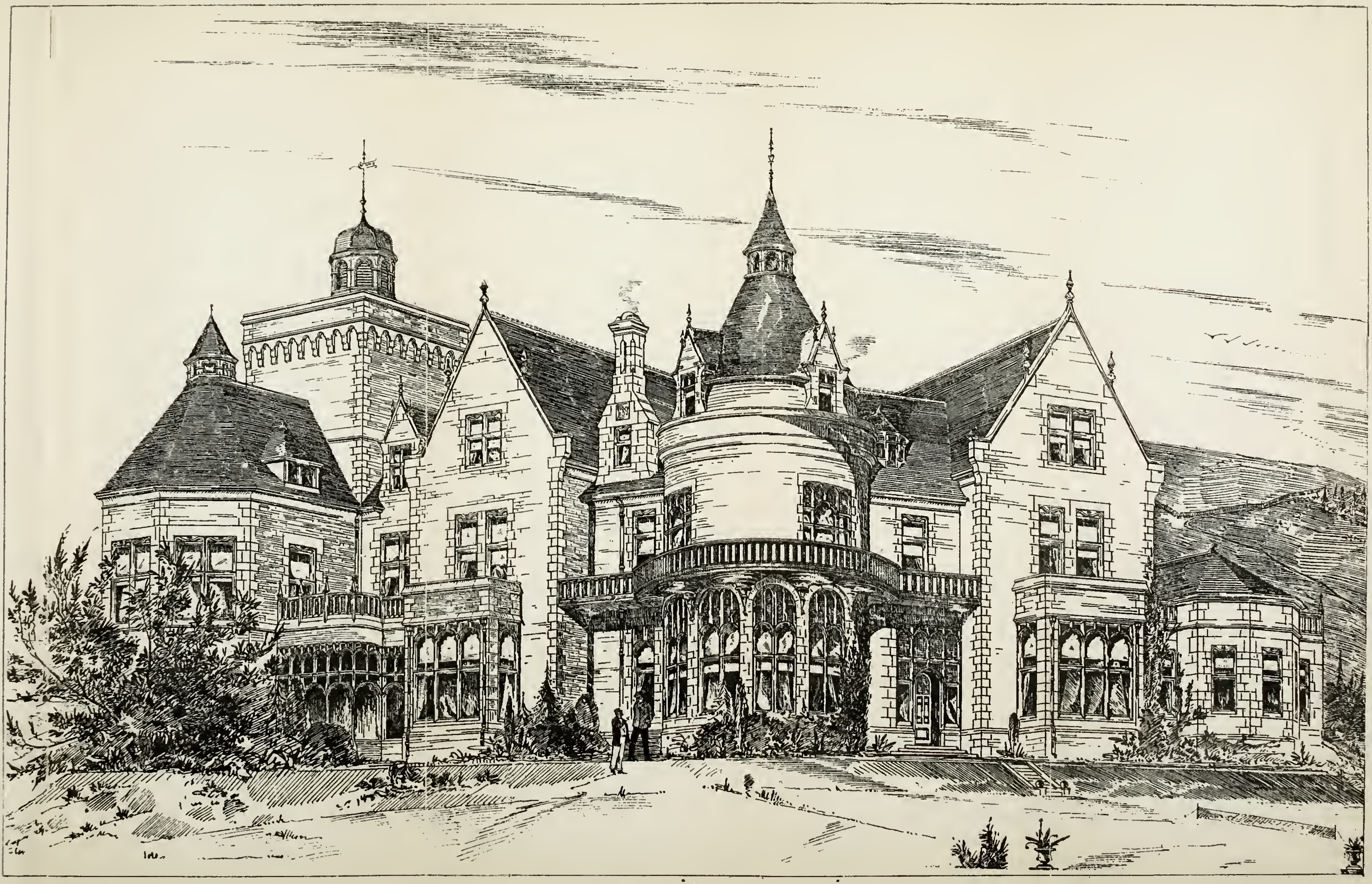



(Plate IV
Pen-and-Ink



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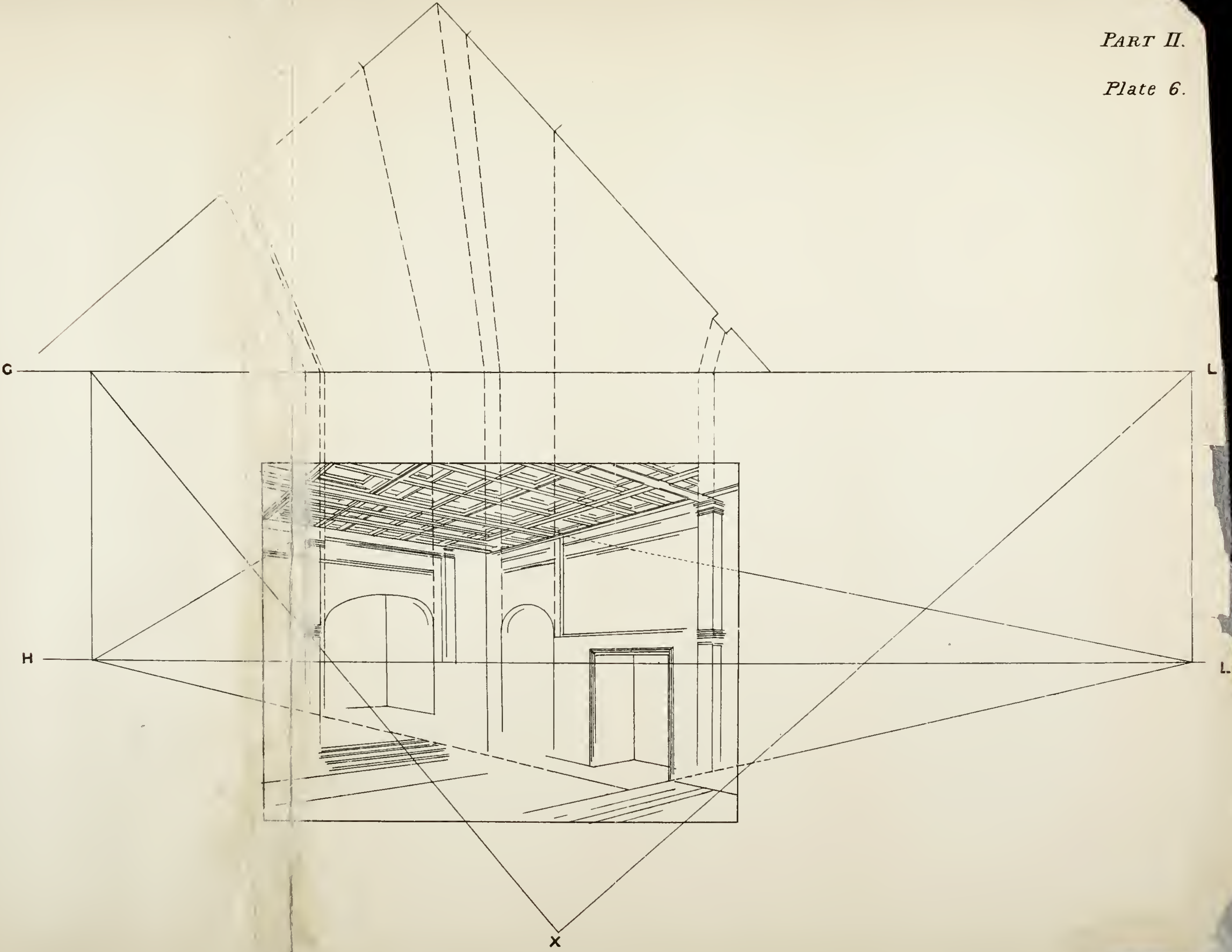
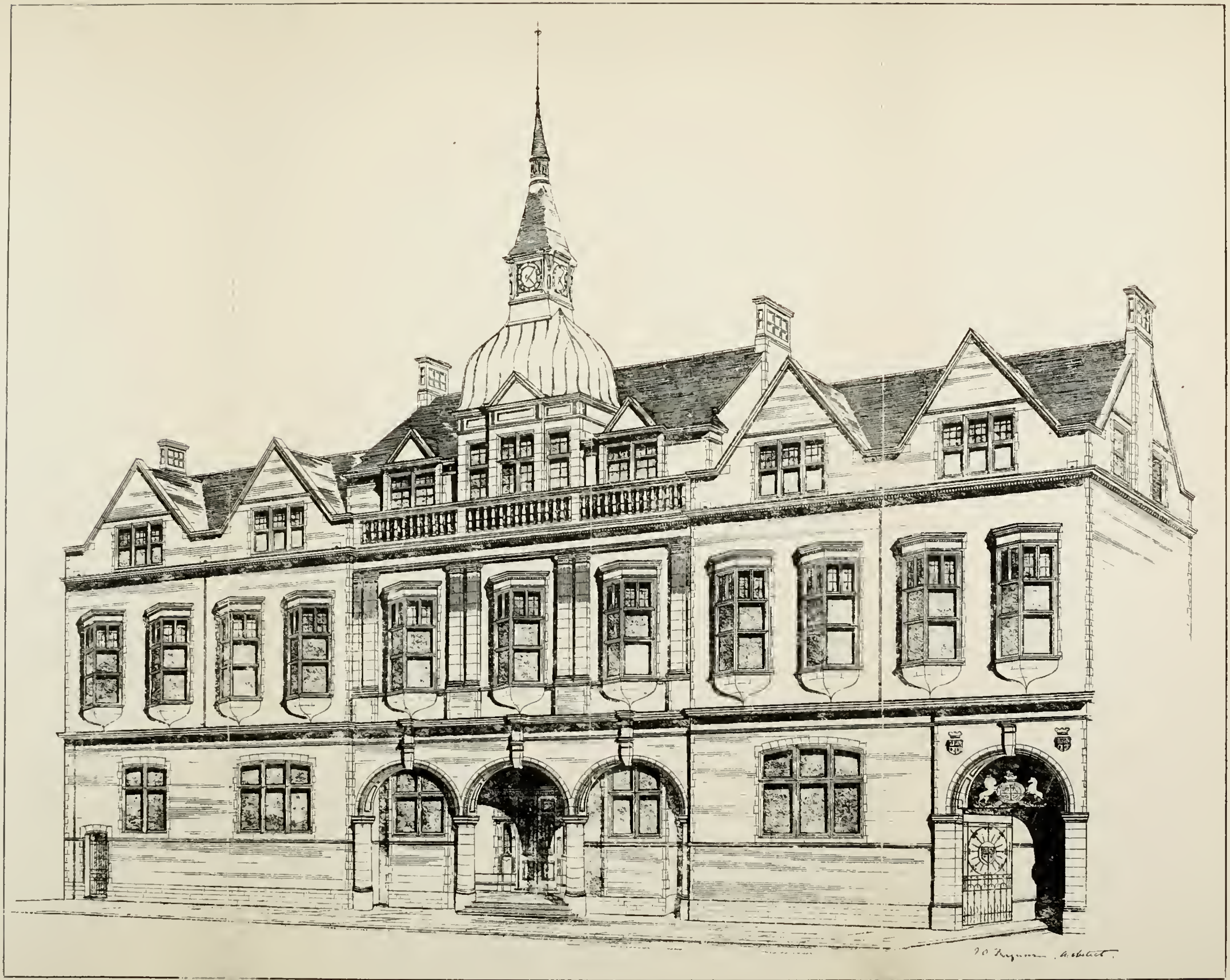
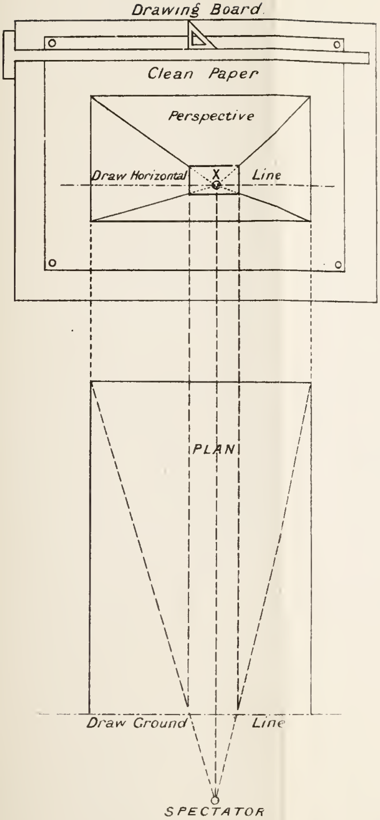



Architect.

PART III.

Figs. 1&2.

1



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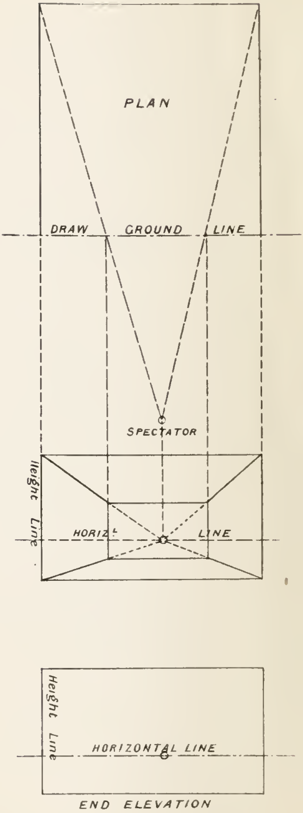
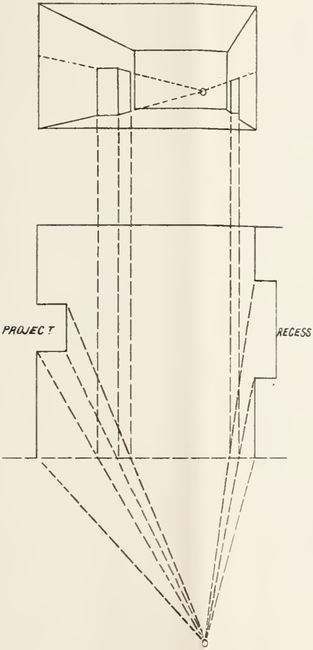


PART III.

Figs 3 & 4.

3



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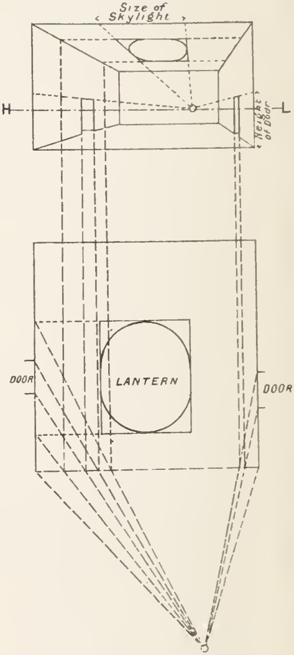
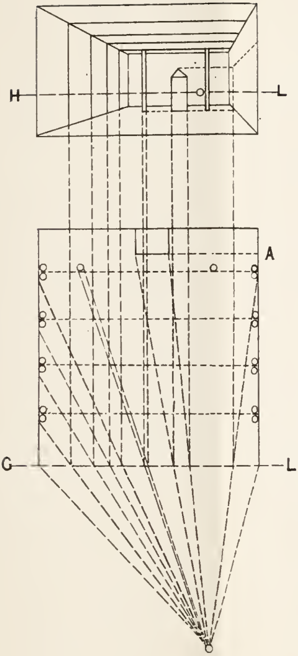


PART III.

Figs 5& 6.

5



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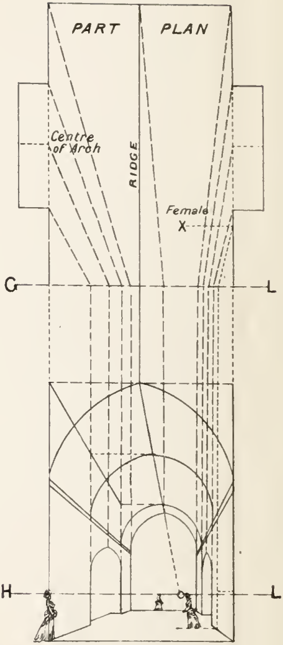
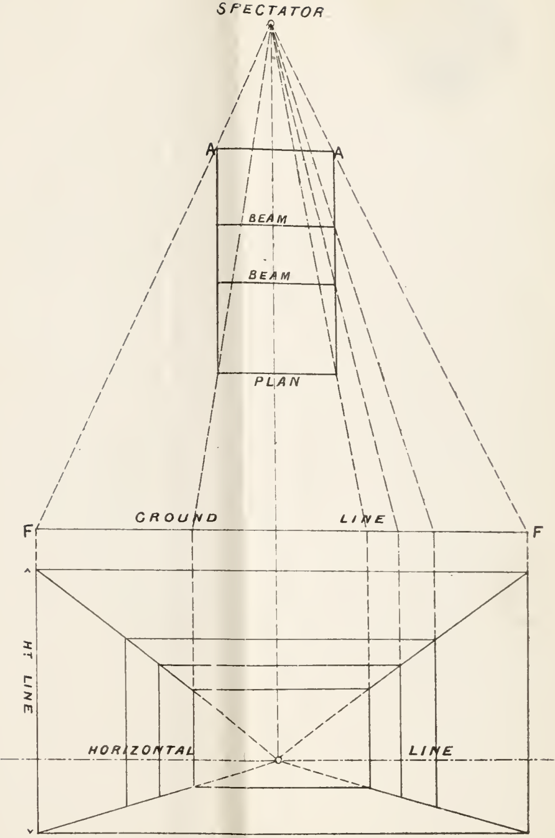


Fig. 7.


SPECTATOR
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